

Rock Products

DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

Vol. VI. No. 6.

LOUISVILLE, KY., FEBRUARY 22, 1907.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

Stucco ! Wall Plasters ! Stucco !

READ

The American Gypsum Company's Ad On Page 85.

UNION MINING COMPANY,

Manufacturers of the Celebrated

MOUNT SAVAGE
FIRE BRICK
GOVERNMENT STANDARD.

DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

**Lime Kiln and
Cement Kiln
Construction**

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

UNION MINING CO.,
Mount Savage, Md.

CAPACITY, 60,000 PER DAY.
ESTABLISHED, 1841.

Northwestern Clay Mfg. Co.
New Windsor, Illinois.

J. O. FREEMAN,
Genl. Mgr.

Sewer Pipe

An inquiry will
be answered.

Drain Tile.

Works: Griffin, Ill.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

OTTAWA SILICA CO., - Ottawa, Ill.

DEXTER Portland Cement
THE NEW STANDARD

Sole Agents **SAMUEL H. FRENCH & CO.** Philadelphia



Phoenix Portland Cement UNEXCELLED FOR ALL USES.

Manufactured by

PHOENIX CEMENT CO.

NAZARETH, PA.

Sole Selling Agent WM. G. HARTRANFT CEMENT CO.,
Real Estate Trust Building PHILADELPHIA, PENNSYLVANIA

"RELIANCE" BELT ABSOLUTELY BEST

FOR GRIFFIN MILLS
FOR TUBE MILLS
FOR BALL MILLS

Chicago Belting Company
MAKERS

67-69 South Canal Street,

SEND US YOUR SPECIFICATIONS.

CHICAGO, ILL.

ALMA
Portland Cement

STANDARD BRAND
OF
MIDDLE WEST.

Specially Adapted to all Reinforced Concrete
and High-Class Work.

Alma Cement Co.,
WELLSTON, OHIO

Binns Stucco Retarder Co.

UHRICHSVILLE, OHIO

The largest manufacturer of retarder in the world.
Write us for prices.

BAGS FOR LIME AND CEMENT

We have recently purchased the factory of the Toledo Paper Bag Co. and have tripled the capacity, and are now in position to make prompt shipment of all orders with the best quality of paper. Prices quoted and samples mailed on receipt of inquiry.

The Urschel-Bates Valve Bag Co. Toledo, Ohio

**Improved Shield
Cement**

The Best Natural Cement
With 3 parts sand—425 lbs. 1 year.
Economical for Concrete.

LAWRENCE CEMENT CO.
OF PENNA.

SIEGFRIED, PA. PAMPHLET FREE.



MARQUETTE PORTLAND CEMENT

Gives Absolute Satisfaction for All Kinds of Concrete Work.

MARQUETTE CEMENT MANUFACTURING CO.,

MILLS: LA SALLE, ILL.

SALES DEPARTMENT: MARQUETTE BLDG., CHICAGO.



ONE GRADE—ONE BRAND.

The Recognized Standard American Brand.

General Offices: EASTON, PA.

SALES OFFICES:

541 Wood, PITTSBURGH.

Builders Exchange, BALTIMORE.

Marquette Building, CHICAGO.

Harrison Building, PHILADELPHIA.

Builders Exchange, BUFFALO.

Board of Trade Bldg., BOSTON.

Park Row Bldg., NEW YORK.

A STANDARD PORTLAND FOR UNIVERSAL USE

PRESENT
DAILY OUTPUT
6,500 BARRELS
INCREASING
TO
17,000 BARRELS



PLANTS
AT
CHICAGO
AND
PITTSBURG

UNIVERSAL PORTLAND CEMENT CO.

CHICAGO

PITTSBURG

Buckeye Portland Cement Co.

ESTABLISHED 1888.

Manufacturers of the celebrated
"Buckeye" brand of

Portland Cement

"Buckeye" has stood the wear and tear in many
important places for the past fifteen years and
under the new process of manufacture is now
better than ever. : : : : : : : : : :

WE INVITE YOUR
CORRESPONDENCE.

Bellefontaine, Ohio.

Treatise on Water-Proof Concrete and Portland Cement Lime Mortars.

A new pamphlet just issued containing
important tensile and permeability tests.

MAILED ON REQUEST.

CHARLES WARNER COMPANY

Land Title Building, Philadelphia, Pa.

Wilmington, Del.

HYDRATED PORTLAND LIME



IS IDEAL FOR

Waterproofing Concrete Blocks

SAVES MONEY. TRY IT.

—FOR INFORMATION AND PRICES, WRITE—

CHICKAMAUGA CEMENT CO.,

Sole Manufacturers.

CHATTANOOGA, TENNESSEE

The Best Portland Cement Is

"LEHIGH"

MANUFACTURED BY



Lehigh Portland Cement Co.

ALLENTOWN, PA.

Write for Catalogue.

Capacity, 7,000,000 Yearly.

Chicago Portland Cement Co.



MANUFACTURER OF...

"CHICAGO AA" PORTLAND CEMENT.

We make one brand only.

The best that can be made.



Manufacturers: Sales Office, Holland Building, St. Louis.

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Rock Products

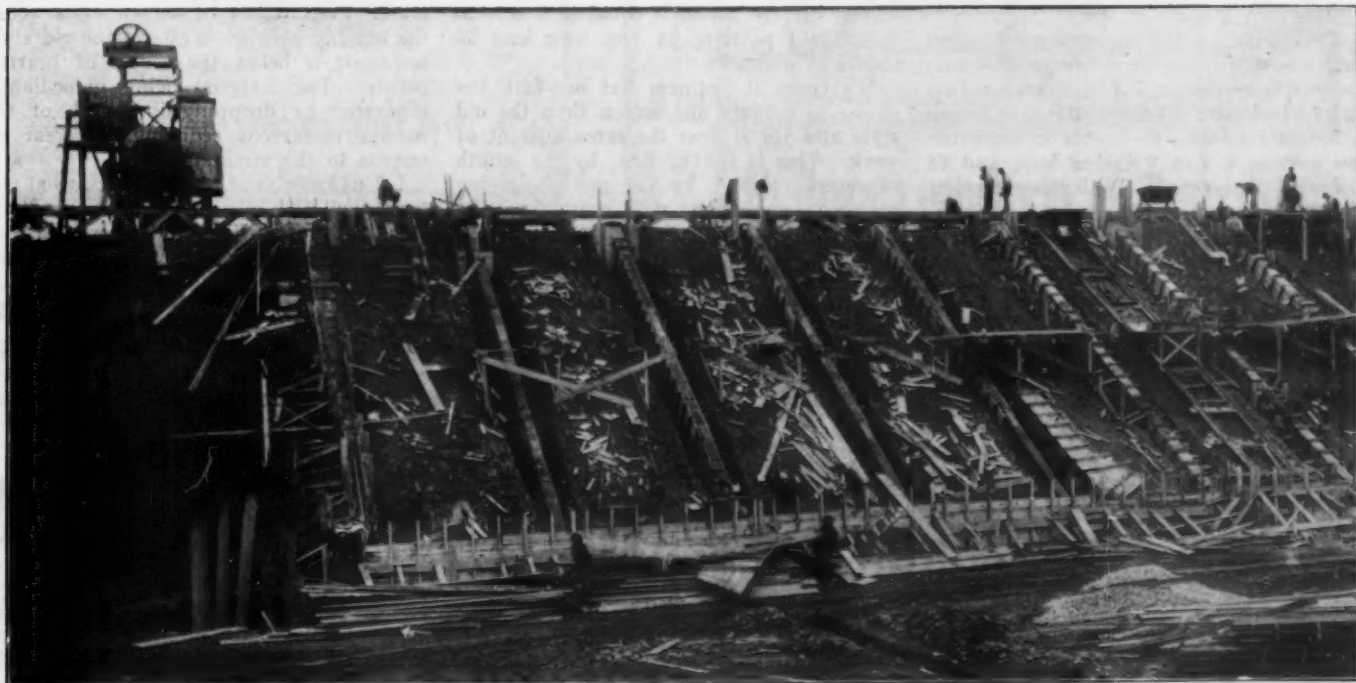
DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

Vol. VI. No. 6.

LOUISVILLE, KY., FEBRUARY 22, 1907.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

Modern Uses of Concrete—A Big Athletic Stadium.



One of the most interesting pieces of concrete construction is the stadium now in process of construction at Syracuse University. The work is being done by the Consolidated Engineering and Construction Co., of Syracuse, according to plans drawn by Architects Revels and Hallenbeck. The work was begun in September and continued until the cold weather made it necessary to stop. It is expected that the work will be completed next fall. The excavation is all done and 200 feet of the grand stand has been completed. The Consolidated Engineering and Construction Co. had 250 men at work last fall and in the spring will put 500 to 600 men on the job.

It is estimated that 12,000 barrels of Portland cement will be needed on the work. The stadium is the gift of John D. Archbold, of the Standard Oil Co., and will cost in the neighborhood of \$500,000.00. The construction is reinforced concrete.

The earliest known stadia which existed in Greece consisted solely of a large hollow in the ground on the slopes of which seats were arranged for the crowds of spectators to watch the athletic games. Syracuse University has been fortunate enough to have a campus, the topography of which admitted of following this method of construction. The stadium will be an oval 675 feet long, 470 feet wide and will have a seating capacity of 16,000, which, however, can be increased to 20,000 by temporary wooden seats. An immense hollow has been excavated and levelled to the re-



STADIUM, SYRACUSE UNIVERSITY; LOWER PICTURE, GENERAL VIEW OF INCOMPLETE OVAL; TOP PICTURE, FORMS FOR THE CONCRETE WORK.

quired dimensions and the slopes all around this hollow are covered by reinforced concrete steps 18 in. high and 27-in. wide. These steps are supported on reinforced concrete girders spaced about 15 feet apart and running down the slope. Every girder rests on five concrete piers which are carried down to hardpan. The field contains a quarter mile track and in order to provide for straight

runs, a tunnel will be constructed at each end. The extensive system of drainage has been provided to keep the fields dry. The main entrance which is located at one of the ends is of an elaborate design and will be entirely of concrete. Particular care will be given to the surface treatment which is one of the most difficult problems in concrete construction.

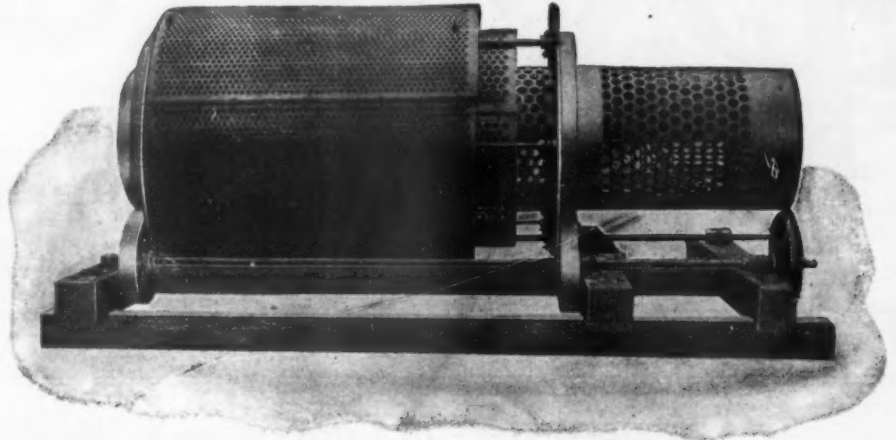
The O'Laughlin Revolving Screen

For Granite, Stone, Sand, Gravel, Coal, Coke or anything requiring separation.

THE principle of separating is exactly opposite that of the older style revolving screen, the materials being discharged on coarse perforations first. The coarse material is immediately separated from the finer in each of the concentric screens to the different required sizes.

The type of screen here illustrated is in use at a No. 8 Crushing plant for limestone (which was formerly equipped with three of the older style screens and required an outlay of \$350.00 for each 100,000 cu. yds. of stone separated. Up to the present time it has made perfect separation into five sizes of 300,000 cu. yds. with a recent outlay of \$27.00 for renewing the portion of the screen that the stone has been discharged on, and should do as much more without any additional outlay.

The inside or longest screen is 8 feet long and 36 inches in diameter, the next concentric screen is 7 feet 6 inches long and 48 inches in diameter, the next screen is 7 feet long and 58 inches in diameter, the next is 6 feet 6 inches long and 66 inches in diameter. With the exception of the inner screen each section is adjustable and the screen is complete without it. The figures given above give 492 sq. ft. of



screen surface which is equal to 3 screens of the old pattern, 14 feet long and 36 inches in diameter.

We claim it requires but one-fifth the power to operate our screen than the old style and yet it does the same amount of work. This is proven first, by the length of screen; second, by the size of driving pinion in comparison with gear; third, by the size of trunnions in comparison to the tread of screen. The material to be sep-

arated and weight of screen rests above the bearing points. While in the old style screen it is below the center of bearing points. The material being immediately separated by dropping into each of the concentric screens reducing the wear on screens to the minimum.

Let us know your requirements, what materials you wish separated, the amount daily and the different sizes, and we will furnish an estimate as to cost, power required, etc.

JOHN O'LAUGHLIN, - - - RACINE, WIS.



**Strength
Durability
Permanence**

Not only laboratory tests, but results in actual work prove the high grade quality of

**Northampton
Portland Cement**

Especially adapted for Cement Blocks, Sidewalks, and all forms of concrete and re-inforced concrete construction.

Northampton Portland Cement Co.

No. 1 Madison Ave., NEW YORK.

Works at Stockertown, Pa.

Use Louisville Hydraulic Cement for Foundations

and invest the amount saved thereby otherwise. Concrete made of Louisville Cement is strong enough for foundations of all kinds, and by the use of it a great saving is effected. The following letter from a well-known firm of Chicago architects, written when Louisville Cement was not ground so fine as it is to-day, shows its good quality and suitability for foundations:

CHICAGO, ILL., Sept 29, 1898.
Mr. A. L. Kanagy, care of Western Cement Co., Louisville.

Dear Sir: In reply to your question concerning the concrete foundations of power house of the South Side Elevated Ry. Co., at 40th and State Sts., Chicago, which foundations were made of Louisville Cement, we beg to say that the foundations have turned out to be perfectly satisfactory, and behaved all the time as we expected they would.

The controversy which arose at one time concerning this was caused by no fault of the concrete or of the cement.

It is true that one of the engines was wrecked and twisted off the foundation bolts without doing any injury to the foundation.

Yours very truly, D. H. BURNHAM & Co.

Louisville Cement mortar made in the proportion of 1 cement to 2 sand, will develop a tensile strength of over 100 pounds per inch in seven days, and will withstand a crushing strength of over 1,000 pounds per inch in twenty-eight days.

Louisville Cement in bags of 4.77 cubic feet per barrel, costs less than 50c per barrel at the mills. At this price a simple calculation will show the economy of its use. Write for pamphlets and test sheets.

WESTERN CEMENT CO.

INCORPORATED

281 West Main Street,

Louisville, Kentucky

Tell 'em you saw it in ROCK PRODUCTS.

Reputation Unrivalled

ONE BRAND ONLY
Sound, Strong, Uniform



ONE OF THE OLDEST AND THE BEST.

Vulcanite Portland Cement Co.

Flatiron Bldg., New York. Land Title Bldg., Philadelphia.

THE TIES THAT BIND

a brick wall *Better* than any on the market are the *Leader and Acme* Wall Ties for solid or veneer walls. Manufactured by

Specialty Manufacturing Co.

1221 Grant Avenue,

WRITE FOR PRICES.

ALLEGHANY, PA.



For Wood, Steel or Concrete Construction. Special Hangers to suit any conditions.

CHAS. MULVEY MFG. CO.

17 to 21 South Jefferson Street, :: CHICAGO, ILL.



Reduce Your Screen Expenditure

We want you to know why "Tyler" Double Crimped Screens have such extraordinary long life; why the meshes are all uniform and accurate even when the wires are almost worn away and why we can guarantee to reduce your screen expenditure. This is all made clear in our interesting book on "Screens," which is also complete in technical information. Put your name and address on the coupon below and mail it to us.

The W. S. Tyler Company

Manufacturers of Wire Cloth from 4-inch Mesh to 200 Mesh.

CLEVELAND, OHIO.

TEAR OFF HERE.

THE W. S. TYLER COMPANY, Cleveland, Ohio.

Please send free of all expense your new book on "Screens."

Mark for Mr.

Name of Company

Address

Dept. "R. P."

RANSOME TWISTED STEEL BARS

For Reinforced Concrete Construction.



IMMEDIATE SHIPMENT. ALL SIZES IN STOCK.

No charge for cutting to required lengths.

WILLIAM B. HOUGH COMPANY,

13th Floor, Monadnock Building, :: :: CHICAGO.

Long Distance Phone, Harrison 1856.

BANNER CEMENT CO.,
MAKERS OF THE FAMOUS BANNER BRAND OF
LOUISVILLE CEMENT.Guaranteed that 90 per cent. will pass a
ten thousand Mesh Sieve.

WE SELL TO DEALERS ONLY.

GENERAL OFFICE: MASONIC TEMPLE,

CHICAGO, ILL.

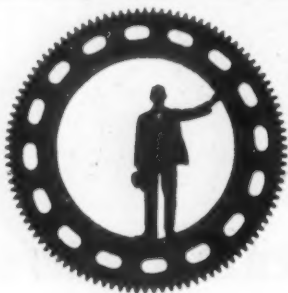
Newaygo Portland Cement Co.

Sales Office: Michigan Trust Building,

GRAND RAPIDS, MICH.

Write us for prices.

Send us your orders

**The First Cost—**is the last cost when you
buy Nuttall Cut or Plan-
ed Gears. Their wear-
ing qualities are remark-
able. Send specifications
and prints.**R. D. NUTTALL CO.**

PITTSBURG, PA.

Improved Utica Hydraulic CementThe finest ground and highest grade Natural Cement manufac-
tured in the U. S. Every car tested by Robt. W. Hunt & Co., and
their test furnished on every car shipped.**MEACHAM & WRIGHT CO. Sole Agents, Chicago.****CHARLES W. GOETZ LIME & CEMENT CO.**

MANUFACTURERS OF AND DEALERS IN

Glenwood Lime, Banner
Brand Louisville Cement,
Portland Cements and
Building Materials.

St. Louis, Mo.

AUTOMATIC ELEVATORSThe greatest invention of the day, will load
sand and gravel both run of bank or screen-
ed for less money per yard than any device
on the market.

For descriptive catalogue address,

SHOEMAKER & CASPARIS,

R. L. SHOEMAKER, Mgr.,

NEWCOMERSTOWN, OHIO.

JEFFREY

**? THE
IMPORTANT
QUESTION****A RELIABLE PAPER BAG****T**HAT will stand severe handling.
and arrive at destination with-
out damaged contents, has been the
one desire of the cement and hydrated
lime manufacturer. We have solved
the problem and can convince you
with the first order.**The West Jersey Paper Mfg. Co.**

Front and Elm Streets

CAMDEN, N. J.

Tell 'em you saw it in ROCK PRODUCTS.



The Standard American Brand

ALWAYS UNIFORM

Dealers who handle

ATLAS PORTLAND CEMENT

find their trade constantly
increasing with the most
desirable Contractors

OUTPUT FOR 1907 OVER 13,500,000 BARRELS



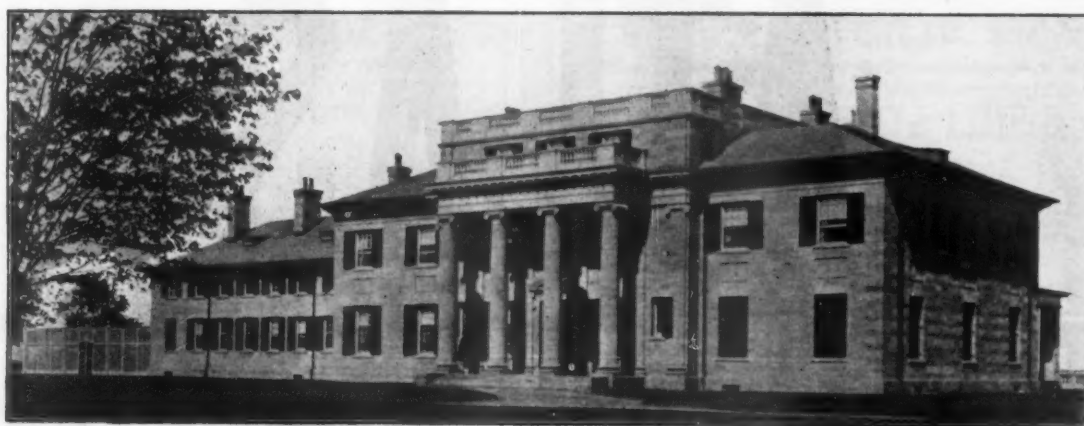
*The Atlas Portland
Cement Company*

30 Broad Street NEW YORK





PENNSYLVANIA



Used Exclusively in this and Other Modern Residences.

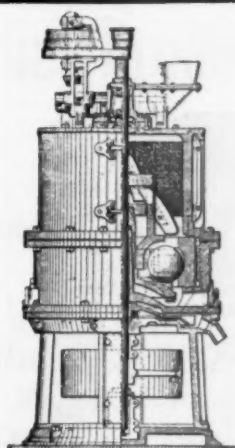
PORTLAND CEMENT



**Pennsylvania
Cement Co.**

26 Cortlandt St., NEW YORK.





Fuller-Lehigh Pulverizer Mill

The Best Pulverizing Mill Manufactured

Exhaustive tests in all departments, in competition with the most approved grinding machines in use, have demonstrated the superiority of our machine

OUR CLAIMS:

Greater Output

Better Fineness

Fewer Repairs

Dustless

"With the four we are now ordering we will have in use 16 Fuller Mills in all, and I think you can hope to get orders from us within the very near future for quite as many more."

"We have to say for your Fuller Mill that it is unquestionably the best grinding device we have ever tried on our lime rock and eminently satisfactory to us."

"We are pulverizing with one Ball Mill and four Fuller Mills sufficient raw material to produce nearly 1200 barrels of clinkers per day, which record I believe can not be approached by any other mill on the market."

If interested, write us for further information

LEHIGH CAR, WHEEL & AXLE WORKS, CATASAUQUA, PA. U. S. A.

STURTEVANT GRINDING MILLS

SIX KINDS

FOR

Hard, Soft or Medium Rock.

Produce a finished product without screens.

SEND FOR CATALOGUE

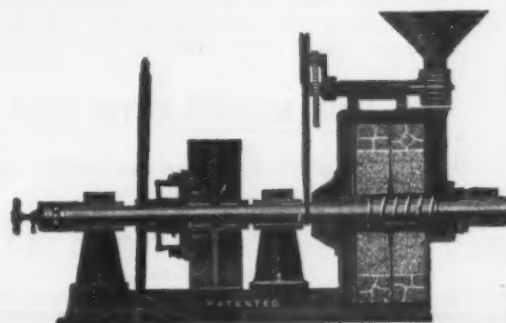
OF

ROCK AND ORE REDUCING MACHINERY.

STURTEVANT MILL COMPANY

105 CLAYTON STREET.

BOSTON, MASS.



Do You Grind Paints or Pigments?

Do you use the Raymond System of Pulverization and Air Separation? Would you use it if you knew it would **SAVE YOU MONEY and INCREASE YOUR EARNINGS?** Write to any of the following satisfied customers:

NATIONAL LEAD CO., Chicago: We are very glad to say that the Raymond Pulverizer, which we have used in our oxide works for several years past, has done its work with perfect satisfaction, and we consider it the best machine for that purpose that we know anything of. It gives a very uniform and regular product in the way of fineness, and does not get out of order easily, being very reliable in its working in every respect.

WESTERN DRY COLOR CO., Chicago: In the three years we have used your mills they have worked to our satisfaction, turning out a uniform fine product and requiring but few repairs.

THE IOWA PAINT MFG. CO., Fort Dodge, Ia. We have used one of your cyclone mills for eleven years, and we highly recommend it after that long service for first class pulverizing work. Your machinery needs but little attention and if it has a fair show it will give perfect satisfaction.

CARTER WHITE LEAD WORKS, Chicago: We have used your Separator for separating out tailings from the red lead and litharge with satisfactory results.

WARREN BROTHERS CO., Boston, Mass. We have been using your mill at our refinery a great deal in the last three years and during the past six months have been grinding magnesite with it, getting 75% passing 200 mesh screen. This latter material we were unable to grind to this fineness with any other mill.

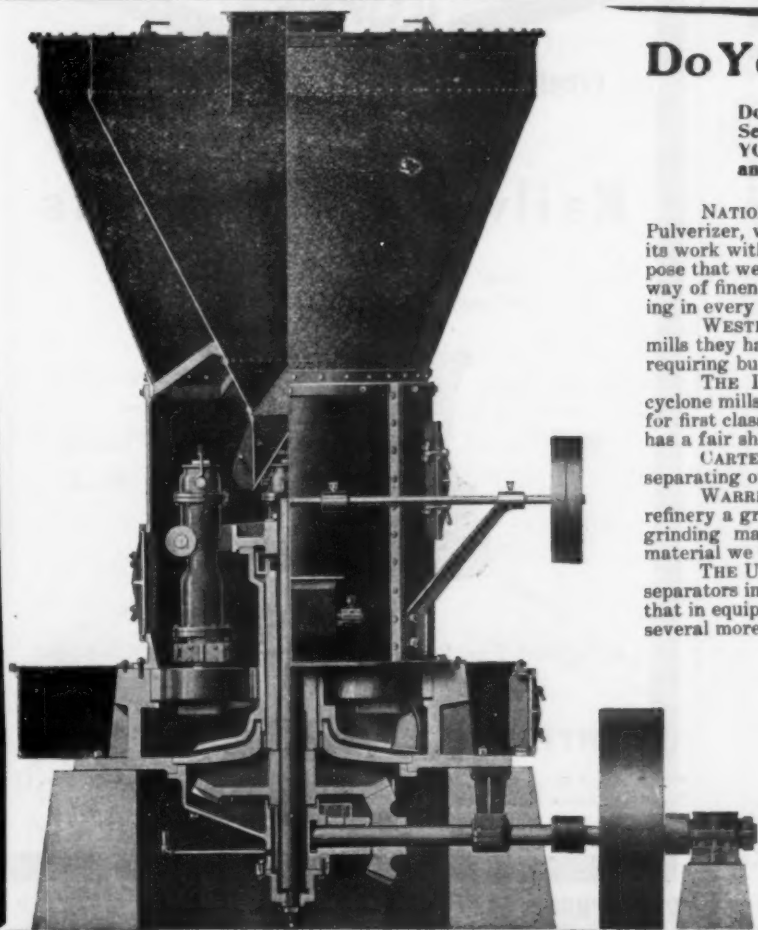
THE UNITED STATES GRAPHITE CO., Saginaw, Mich. We have used your separators in our plant here at Saginaw upwards of ten years with such satisfaction that in equipping the new plant which we moved into only a year ago, we installed several more of them.

These are a few out of the many, all highly satisfied users of the **RAYMOND SYSTEM**. How would you like to travel in their care-free class?

Raymond Bros. Impact Pulverizer Co.

141 Laflin Street,

CHICAGO



Economy Dictates

that the jaw-plates, cheek-plates, cones and concaves of your crushers should be made of

"Taylor-Made" MANGANESE STEEL "Taylor-Made"



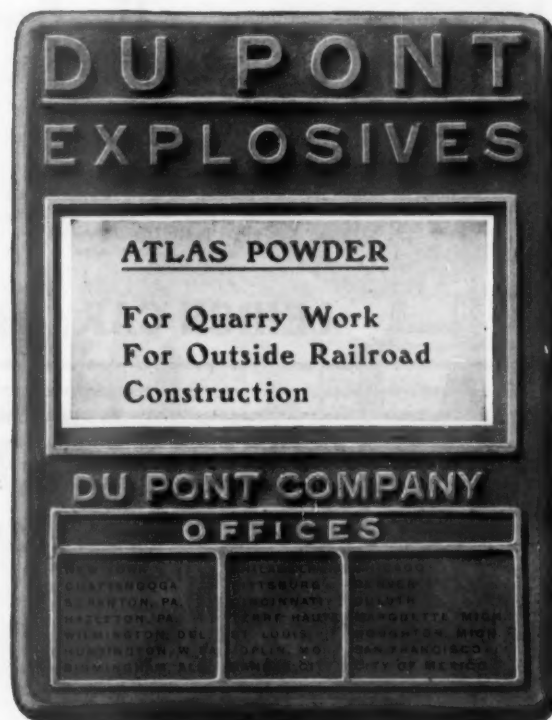
The actual ratio of wear in "Taylor-Made" plates, as compared with other castings, has been proved by large users in hundreds of cases to warrant their use.

"THE REASON'S IN THE STEEL."

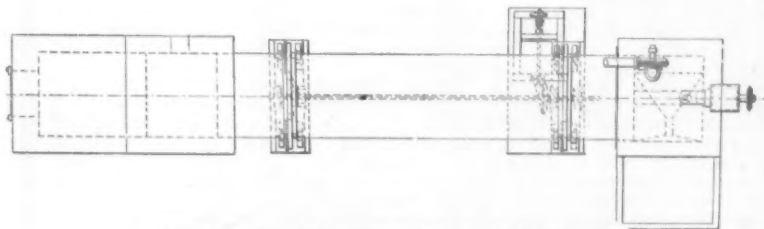
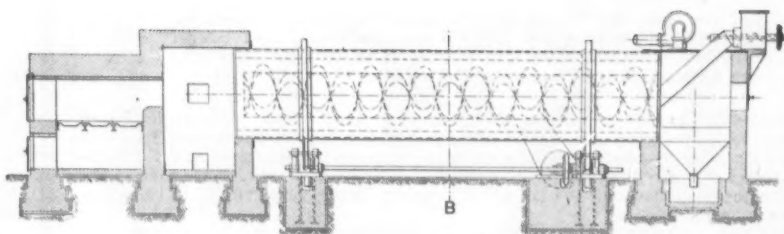
We shall be pleased to give you further information.

Taylor Iron & Steel Co.

HIGH BRIDGE, N. J.



DRYERS FOR ALL MATERIALS



The accompanying cut shows the method used mostly for the drying of a vast number of different materials, yet in many cases will be objectionable. We therefore build dryers to meet the requirements.

We shall be pleased to estimate the cost of any dryer upon receipt of full information as to requirements and facilities for operating, accompanied by a sample of the material to be dried.

J. R. ALSING CO., Engineers and Manufacturers

MAIN OFFICE: 136 Liberty Street,

NEW YORK

WORKS AT

KOPPEL

COMPLETE BEAVER COUNTY, PA. INDUSTRIAL

TRADE MARK

Railway Equipments

For the Clay Worker, Brickmaker, Cement Worker, Mines and Quarries.

Write for Catalog No. 37

IN STOCK

Rails, Steel Ties, Portable Track, Switches, Frogs, Crossings, Steel Dump Cars, Flat Cars, Turntables, etc.

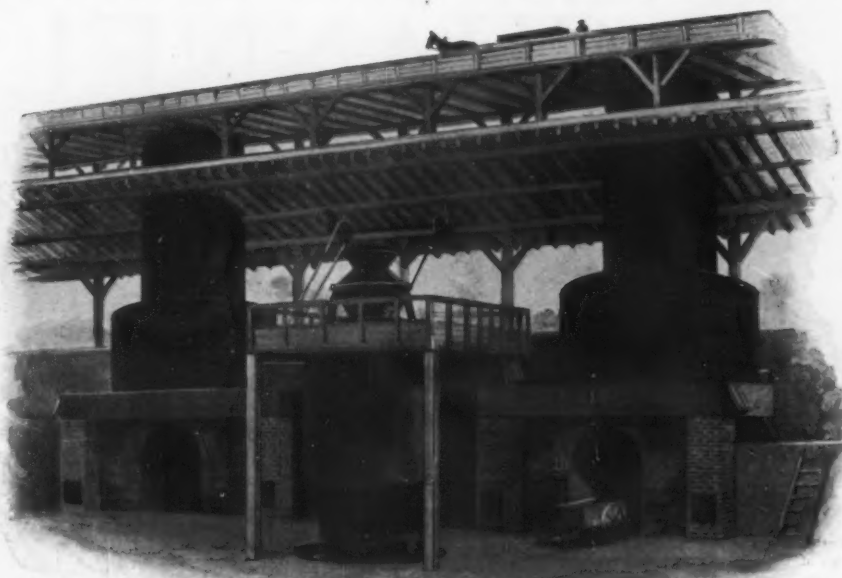
ARTHUR KOPPEL COMPANY

66-68 Broad Street, New York. 1639 Monadnock Block, Chicago.
53 Oliver Street, Boston. Machesney Bldg., Pittsburg, Pa.
515 Market Street, San Francisco.

Tell 'em you saw it in ROCK PRODUCTS.

Gas Producer Plant of the New England Lime Co., Canaan, Connecticut.

PRODUCER GAS
Makes the Best Lime
It increases the
Capacity of a Plant
and Reduces the
Fuel Bill

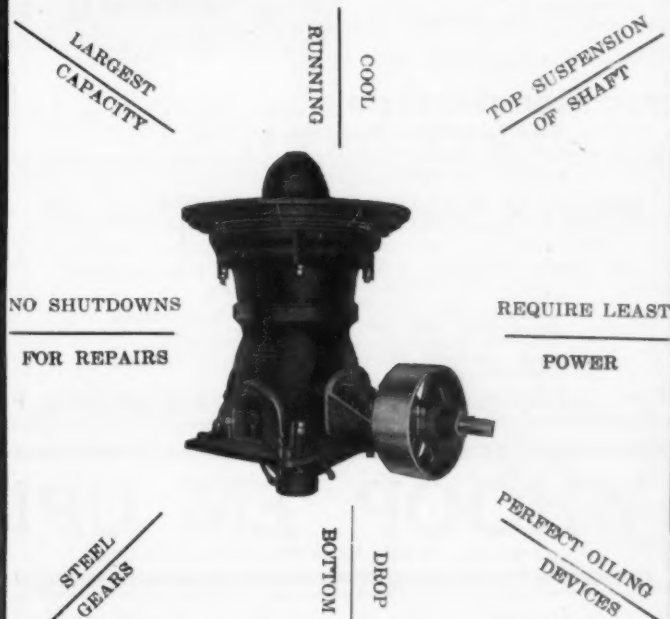


The Total Cost of
This Installation
Will be Paid for by
the Saving Effected
During the First
Year of Operation

"We have equipped two plants for above company and are now equipping a third."

MORGAN CONSTRUCTION CO., Gas Producer Dept., Worcester, Mass.

McCully Gyratory Crushers You See Them Everywhere



(Write for Catalog No. 4.)

Power and Mining Machinery Co. Cudahy, Wis.
(SUBURB OF MILWAUKEE)

LION FUZES AND BLASTING MACHINES

ARE THE BEST

If you do not fire your blasts by electricity, you should send for the booklet

"FIRING BLASTS BY ELECTRICITY"

Which tells all about this method. If you are already using fuzes, you should have the book anyhow, as it contains many valuable hints. Sent free.

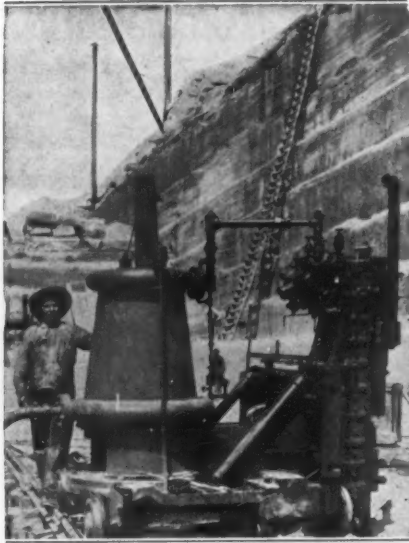


No. 1, Capacity, 8 Holes
No. 2, Capacity, 25 Holes
No. 4, Capacity, 50 Holes

The AETNA POWDER COMPANY

143 Dearborn Street, CHICAGO

Get 'em you saw it in ROCK PRODUCTS.



"H-8" Ingersoll-Rand 8-inch Channeler with Air Re-heater in Gray Cannon Quarry of the Cleveland Stone Co., North Amherst, Ohio. Six more of these machines have just been installed by this company.

TRACK CHANNELERS

The roller guide on Ingersoll-Rand Channelers is a patented feature giving the following exclusive advantages:

The cutting engine being free from the weight and friction of the cross-head, runs as free as a rock drill.

This gives the channeler a higher speed, a harder blow, a greater capacity and a higher economy than any other type.

The steels being guided on four sides close to the rock, a cut may be started on an irregular surface without glancing and running off into a crooked channel, saving much hard work.

When cutting up to an end, the strains come direct upon shell and frame, NOT upon piston rod and gland; thus avoiding the heavy wear, leakage and loss of power of other types. These features are characteristic of both the "Heavy Track," and "Marble" Channelers of the Company.

Air Compressors

Rock Drills

Hammer Drills

INGERSOLL-RAND CO.

Chicago
Cleveland
Birmingham

Pittsburg
Philadelphia
San Francisco

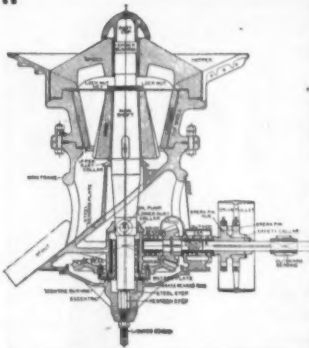
11 Broadway,
NEW YORK.
Seattle Denver

St. Louis
Houghton
Salt Lake

El Paso
Boston
Los Angeles

P-26

THE AUSTIN GYRATORY CRUSHER IS THE ONLY ONE HAVING AN AUTOMATIC OILING SYSTEM.



The strain on the bearings of a gyratory crusher is so great that if dust reaches them or if imperfectly lubricated they are certain to be quickly destroyed and the machine laid up for repairs. The bearings of the "Austin" are enclosed in a double chamber—absolutely dust proof—and are lubricated by a constant circulation of live oil forced through the main eccentric bearing—which is the life of the machine—by an automatic pump operated directly by the gyratory movement of the main shaft. The lubrication must be perfect because the flow of oil is constant and positive.

In all other gyratory crushers there is only the discharge diaphragm to separate the dust from the bearings and gears, and a side door opens directly into the chamber containing the bearings. Dust gets into this receptacle readily and destroys the gears.

Immediately below the crushing head, in the "Austin" is placed the discharge diaphragm with dust collar the same as in any other gyratory crusher. Below this partition is a second diaphragm also provided with dust collar around the shaft and a dust cap covering the pinion, contained in no other crusher, en-

closing the bearings in a double dust proof chamber and making it simply impossible for dust to reach the bearings.

At the bottom of the frame in the "Austin" is an oil cellar which is filled with oil to the level of the center of teeth in the main gear.

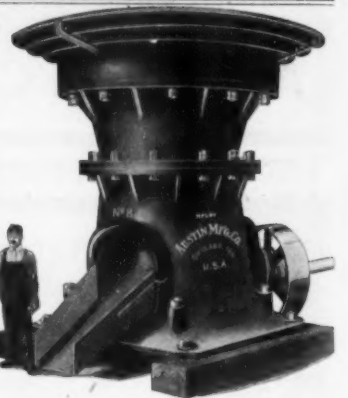
An automatic pump draws pure oil from this cellar, forces it through the eccentric and counter shaft bearings and any oil thrown from the teeth of the driving gear is caught by the cap and carried back to the cellar.

At the bottom of the cellar is a drain by means of which the impure oil can be removed insuring absolutely perfect lubrication because every part of the bearings operates continuously in a bath of pure oil.

One never has to expose the bearings of the "Austin" to dust when in operation. Fill the oil cellar to the required height and the machine must oil itself since no oil can escape from the oil cellar and therefore maintains a constant level.

Sizes for all requirements. We are the world's largest builders of rock and earth handling machinery.

Catalogues of all departments on request.



Austin Manufacturing Co. Chicago, U. S. A.
New York Office, Park Row Building

HIGH GRADE

FIRE BRICK

For Cement Works, Lime Kilns, Cupolas, Steel and Iron Works of every description

Louisville Fire Brick Works, K. B. GRAHN, Prop.,
Highland Park, Ky. P.O.

HENRY S. SPACKMAN ENGINEERING CO.

Official Chemists, National Association of Manufacturers of Sand Lime Brick.

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21 Tons Put Thro Since January 1.



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We are not connected with any Trust or Combination.

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Excelsior Hydrated Lime

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The best prepared Lime in the market. Is superior to hot Lime for all purposes. Will not deteriorate. Absolutely pure and free from foreign ingredients. Successfully used for more than two years by the largest users of Hydrate in the country.

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Try us on your Portland Cement requirements

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Largest Capacity of Hydrated Lime in the United States.



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Lime.

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ITS HISTORY IS A STORY OF SUCCESS.

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ON THE MARKET

Uniform Quality

Finest Grain

The American Clay Machinery Co.
WILLOUGHBY, OHIO

May 16, 1906.

The Mitchell Lime Co.,
Mitchell, Ind.

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Replying further to your favor of the 8th inst requesting us to advise you the result of practical test of your lime in the manufacture of sand-lime brick. We are pleased to advise you that the lime hydrated easily and the brick made from it were first-class in every respect.

We have forwarded some samples of it to Mr. Elkus of the Indianapolis Composite Brick Co. and he can probably advise you further.

Very truly yours,

The American Clay Machinery Co.
by W. J. Burks.

MITCHELL LIME COMPANY
MITCHELL, INDIANA

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Brick Work.

Silex Linings for Tubemills
Best Quality Dana Flint Pebbles
Forged Steel Balls

F. L. SMIDTH & CO.

ENGINEERS

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Manufacturers of, and Wholesale Dealers in

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Catalogue No. 28.

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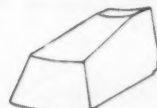
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ROTARY CEMENT LINERS.



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WALL PLASTER
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BOILER SETTINGS

DIRECT HEAT

DRYERS

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GLASS SAND
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See Other Ad.
Page 79.

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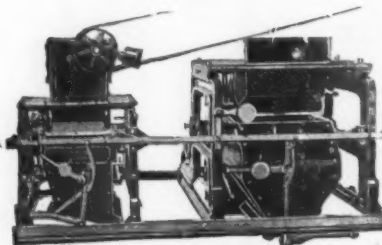
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SEMI-MONTHLY.

Entered as second-class matter December 16, 1905, at the Post Office at Louisville, Ky., under Act of Congress of March 3, 1879.

THE FRANCIS PUBLISHING COMPANY,
Publishers.

E. H. DEFEBAUGH.....President.

A semi-monthly trade journal devoted to the interests of the manufacturers and dealers in rock products and kindred lines, including Lime, Cement, Salt, Sand, Slate, Granite, Marble, Sandstone, Grindstones, Artificial Stone, Emery Stone, Quarries, Monuments, Manganese, Asphalt, Phosphate, Plaster, Terra Cotta, Roofing and Roofing Tile, Coal, Oil, Mineral Wool, Brick, etc.

EDITORS.

E. H. DEFEBAUGH. FRED K. IRVINE.

ASSOCIATE EDITORS.

HENRY C. WHITAKER.....Barre, Vt.
ALEX. CRISTADORO.....New York.

Regular Staff Correspondents in the Principal Centers.

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LOUISVILLE, KY., FEB. 22, 1907

We invite you to visit the Greater Louisville Exposition, March 18-30.

February, a Convention Month.

The month of February 1907 may justly be called the convention month of the builders' supply view. The big National Convention was held at Columbus, O. The dealers of the State of Illinois came together jointly with the lumbermen at Chicago and a similar convention was held at Kansas City embracing the states of Missouri, Kansas, Nebraska, Iowa, Oklahoma and Arkansas. All of these were occasions where the supply dealer and the manufacturer of building materials of every description got together and placed their business interests upon a footing of mutual understanding, so that it is safe to say that the building operations of 1907 are to be carried on with a more intelligent appreciation of all the factors involved than any previous year.

Improvements of Waterways.

The public policy of a water-way system to be secured by the improvement of the rivers of the Mississippi Valley grows in importance the more the matter is studied. About 60 per cent of the total area of the United States is located within the Mississippi Valley. The domestic commerce

carried upon our water-ways at the present time under the existing signally inadequate arrangement amounts to nearly 90 per cent of that carried by all of the railroads. In point of population the Mississippi Valley represents about half the population of the country and will in a few decades represent three-fourths of the population. The great inland cities of Cleveland, Detroit, Chicago, St. Louis, Kansas City, Pittsburg, Cincinnati, Louisville and Memphis are fast reaching the point where a water-way to the Gulf by the port of New Orleans is absolutely indispensable for ocean-going vessels.

The difficulty and expense of rehandling and transporting the commodities necessary to modern civilization to accommodate the ever growing population is rapidly becoming impossible by such facilities as can ever be offered by railroad accommodations. The commerce of the world and intercommunicating commerce of these cities will in the near future have to be carried in vessels delivering cargoes at their respective docks with a single handling, the loading at shipping point and the unloading at destination. The rehandling done at the coast cities at the present time constitutes an expense which would soon amount to a sum of money almost sufficient to pay for the necessary locks and dams and retaining walls and other engineering undertakings that would be necessary to bring about this much needed improvement. This is just as many times more important as a public improvement than is the Panama Canal as the number of people who would be directly benefited by such improvement out-numbers those who will be benefited by the completion of the Panama Canal. The improvement of the great rivers of the Mississippi Valley must no longer be looked upon as a vaguely distant and well nigh impossible undertaking. The time to undertake it is now here and to a great people with unlimited resources even such a great undertaking becomes clearly possible.

The Concrete Contractor.

The builder who employs concrete must necessarily exercise a higher degree of intelligence than one who takes his materials as he finds them and employs the methods of the ancients throughout the whole undertaking. In concrete construction every part of the process is absolutely new, not a single material factor can be employed in the shape that it comes to hand. True, the cement manufacturers have reduced their product to a staple known element but the sand must be separated in the various sizes and washed; the crushed rock has to be treated in much the same manner, and the inspection of all these preliminary preparations of the material must be considered by and passed upon by the concrete engineer. The successful builder of today is in fact quite as much of a student as the physician and the lawyer who in times past were looked up to as members of learned professions.

More and Cheaper Sand Needed.

THERE'S one thing that the concrete industry is calling for now and the increase of the demand makes the call louder every day, that is, more sand, better graded sand, and at the same time, cheaper sand. The concrete engineer and concrete contractor are rapidly coming to a better understanding of the necessary qualifications of the aggregate of which sand is an indispensable factor. If the people who supply the sand for concrete operations don't sit up and take notice, and keep abreast of the times with their equipment and provide the definite separations, the lack of which at the present is a considerable menace to the concrete industry,

they will soon find the up-to-daters taking the business away from them. Since there is no literature upon the subject, except that which has been produced by this journal and the number of their customers are few, sand producers generally are inclined to overlook the department which we conduct monthly for their benefit, for their information and advice.

WHEN in doubt, ask the information bureau of ROCK PRODUCTS.

THE cost of a product is nearly always determined by the character and quality of the equipment of the plant.

THE only remedy for expansion cracks in large concrete surfaces is to properly provide expansion joints. Now, don't overlook this point.

IT is amusing to note the remarks of brick-layers with regard to concrete construction. This applies to the ancient clay brick manufacturer as well.

THE contractors are anxiously awaiting the approach of spring to jump right in where they left off when the cold weather called a halt at the close of last season. Last year broke the record. Now, with a pull all together, let's raise the "ante."

AN expert says that concrete is perfectly tamped when the stroke of the tamper produces the same result as putting a quiver on the surface of a mold of jelly just released from the tumbler; that is, when it quivers so as to indicate a semi-liquid condition. When too much water is present such a consistency can not be obtained.

THE cement shingle, or more properly the cement roofing tile, is at last getting into a shape where it can be used for almost any kind of a roof and at the same time successfully compete with other commodities designed for the same purpose. It has taken a longer time to develop than any other branch of the industry but seems to be right here now.

THE man who fails to read the advertisements of the trade paper which represents his line of business is apt to find himself competing with a better informed competitor whose product is costing him less to produce. So the man who fails to keep up with the times is accepting the short end of the deal and every time you meet a complainer it soon develops that he is one of the fellows who can't afford the time to keep posted.

ACCORDING to the latest reliable test of well made and properly cured building blocks the crushing strength has been found to be 1,500 pounds to the square inch, approximately. Surely this seems to indicate that the factor of safety is certainly high enough even if the blocks were differently made. Still, there is nothing so sure to command a steady market as good goods nor to hold that market when once secured than reliable and uniform goods.

THE crop of municipal and other improvements promises in the coming season the profitable employment of every contractor who is looking for work upon streets, sewers, water supply and side walk propositions. This condition prevails particularly in the larger cities and towns in the South, where such improvements have long been needed and are now known to be indispensable from the standpoint of adequate sanitation. The work of this character now being done and in contemplation at the city of New Orleans alone amounts to millions. Louisville is in the running and Nashville, Birmingham and Atlanta all have a bunch of this same kind of work.

From Our Own Correspondents.

GREATER NEW YORK.

NEW YORK, February 14.—"Practically every barrel of cement manufactured in the United States during the year 1906 was sold or consumed, the supply just about equalling the demand," says Albert Moyer, sales manager of the Vulcanite Portland Cement Co., with offices in the Flat Iron Building. "But very little foreign cement was brought into the United States; in fact the American cement exported was in excess of the foreign cement imported. The foreign cement market, both in Germany and England, was pretty well sold up before May. Several American manufacturers who had oversold tried to buy four or five hundred thousand barrels of Portland cement but were unable to do so. The price prevailing is reasonable and does not discourage concrete construction. It rather encourages it and covers the manufacturer by a reasonable profit."

The outlook for concrete construction in New York is pleasing and decidedly encouraging. While this city has been behind some western cities in taking up this form of construction at the present time New York looks to be the "one best bet" for concrete work. At the present time there are more than a dozen concrete structures under way in Manhattan and fully twice that many are already completed in which part if not all of the construction is in re-inforced concrete.

The use of concrete blocks for walls has not received much support in New York, particularly in Manhattan. But in the outlying districts numerous private dwellings have been constructed of these blocks. Cement brick are also coming into use rapidly in the metropolis.

One of the most modern if not the foremost re-inforced concrete building in Greater New York is that being erected for the Eastman Kodak Co. on West 23d Street, Manhattan. This building embodies many advanced ideas in building construction. It is rapidly nearing completion. The Turner Construction Co. were the re-inforced concrete engineers for this building and the speed of erection attained was far ahead of all other attempts in Greater New York.

A newly incorporated cement block and brick concern has been organized at Port Washington, Nassau county, N. Y., which will be known as the Long Island Cement Block and Brick Co. The directors are Robert J. Culhane, Walter K. Welch and William A. Cooper, of New York City.

Irving Barr, secretary of the New York Concrete Association, says that everything pertaining to the association's plans for occupying the top floor of the New Brunswick Building, 26th Street and Fifth Avenue, is practically settled except the signing of the lease and that will be done in a few days. The association will occupy the greater portion of the top floor where ample space will be given to a permanent exhibit of cement products. An information bureau will also be conducted for the benefit of engineers, architects and builders, who may be interested.

Frederick P. Kafka, C. E., has tendered his resignation as manager of the New York office of the Unit Concrete Steel Frame Co. to accept a similar position with the concrete department of the General Fireproofing Co., of Youngstown, O.

AROUND BUFFALO.

BUFFALO, N. Y., February 15.—Whether grade crossing work to be done in Buffalo in the near future at various grade crossings in the northern part of the city shall be done with concrete or stone is an interesting question which was raised at a recent meeting of the grade crossing commissioners here. The work will involve an expenditure of upwards of \$3,500,000.00. After the meeting it was announced that a delegation of stone

cutters recently called on Chairman Scheu of the commission and requested that stone be used in future grade crossing work instead of concrete.

An action has been filed in the United States District Court in this city by the Eastern Concrete Steel Co., of Buffalo, against the Trussed Concrete Steel Co., of Detroit, to recover judgment for \$4,405.36 for merchandise alleged to have been sold and delivered to the defendant.

An appropriation of \$350,000.00 to repair the injury to the Buffalo breakwater on account of a storm, has been inserted in the pending river and harbor bill at Washington. Much cement and stone will probably be used in the repair work. This is an emergency provision and the money is made available immediately so that there may be no unnecessary delay in putting the breakwater back in its original condition.

The contract to build the concrete floor in the proposed new steel wire mill of the James A. Spargo Wire Co., of Rome, N. Y., has been let to the Michael B. Peters Co., of Utica, N. Y.

The handsome concrete home of J. H. Reynolds at Bolivar, N. Y., is still attracting much attention. It is the first house of its kind in that place.

Judge Hazel, of Buffalo, has granted a motion to confirm the reports of Referee Van Voorhis, of Rochester, N. Y., in the case of the Cement Products Co., of that city. It was not denied that the company was insolvent but the answer of the company to the bankruptcy petition was that the petitioners did not have provable claims to the statutory amounts. The referee in bankruptcy to whom the case was referred as special master found the petitioning creditors had liquidated claims exceeding the amount required by law.

Three hundred feet of the breakwater at Oswego, N. Y., was recently washed away in a storm there. It is expected that much cement will be used in repairing the work.

CLEVELAND AND NORTHERN OHIO.

CLEVELAND, O., February 15.—This month is naturally the quietest of the year for concerns interested in the use of concrete and various kinds of rock products. Owing to the cold winters experienced here building is almost entirely at a standstill as far as outside work is concerned. It is practically the only month experienced this season when building operations could not be proceeded with. Most of the work being done now is inside finishing, though a couple of concrete buildings are being erected notwithstanding the chilly weather.

Work is confined for the most part to the offices of architects and contractors who are busy drawing plans and figuring on new structures to be erected as soon as the wintry weather lets up a little. An exceptional amount of building is in sight.

A new fireproof hotel to cost nearly half a million is to be erected early in the spring at the intersection of Walnut and East Ninth Streets. It will be twelve stories in height and will be constructed of concrete and steel, with brick trimmings and facings. A permit has been issued by the building department for the construction of a six-story steel and concrete building at East Sixth and Austin Sts. to be used exclusively for cold storage purposes and to cost \$100,000.00. The work on the twelve story office building being erected on the Euclid Avenue entrance to the new mammoth Hippodrome building is being rushed, the steel work being in course of erection at the present time. Much of the building will be of concrete, the facings being of brick.

The Carey Construction Co. is proceeding with the erection of the parochial school for St. Stanislaus parish. This building is to be entirely of concrete, even to the stairways, and is to cost \$80,000.00 when completed. The basement and first story have been constructed, and even the cold weather is not being permitted to stop the work, for salt is put in the concrete mixture to keep it from freezing and all the irons and implements used are heated in advance. The Carey Co., engineers, are busy on three or four big contracts which they will be ready to announce next month. The company reports that the outlook for 1907 is exceptionally bright and that a busy season is assured.

Winter has few terrors for the Kelley Island Lime and Transport Co. Although Kelly Island, set out in the midst of ice floes in Lake Erie is cut off from navigation and can be reached only

across the ice, some 800 men are hard at work at the various lime and crushed stone plants getting out stock to be used during the approaching season. The company shuts this the best plan, for if the plants were shut down it would be impossible to recruit a force of skilled men to proceed with the work when spring opens up. The material being gotten out now will be brought to Cleveland and other points of distribution, just as soon as navigation opens, which is usually about March 15, and the company's fleet of eight boats will be put into commission again.

A new stone crushing plant is being installed at Kelley Island which is to have a capacity of 2,000 tons a day. The building is being erected of a concrete block made by the company, consisting of Lehigh Portland cement and the coarse limestone screenings. This combination is said to make a most attractive block. The other stone crushing plants and lime kilns are all working at the island.

There is quite an active demand for sand for small jobs. Sand sells at 70 cents a ton at the distributing stations of the big companies. Lime is selling at 65 cents per barrel, not delivered.

On March 1 the Kelly Island Co. will change its offices from the Commercial Bank building, where they have been located for years, to the seventh floor of the new Rockefeller building, which is directly opposite. The concern will acquire about a third more space by the move and will be able to expand when necessary.

Aaron Mathews, credited with being the first man to lay a cement walk in Cleveland, died during the past month at Los Angeles, and was brought to Cleveland for interment. Mr. Mathews started in the cement walk business in 1875. Ten years ago he took into partnership his son-in-law, J. H. Libby, who is one of the leaders in cement work in Cleveland to-day.

Although the new group plan for Cleveland, involving the expenditure of some \$50,000,000.00 for buildings, will be built largely of stone, there will be an immense amount of concrete used, and local concrete contractors are waiting patiently for details of the work. The Federal building is nearly completed, the city hall and courthouse are being planned, the library board is endeavoring to secure appropriations and the latest announcement is that the railroads will spend \$15,000,000.00 for a new union depot. As forty tracks must be elevated twenty or thirty feet the amount of concrete work needed may be imagined. A few days ago another announcement was made that a \$1,000,000.00 hotel of stone and concrete is to be made a part of the plan.

Within the past two months Cleveland has been treated to the sight of two new towering chimneys of concrete being erected in this city. One towers above the works of the Sherwin Williams Paint Co.'s plant, while the other was completed a few days ago at the new city lighting plant. The latter is 150 feet high and cost \$19,000.00 complete. Concrete chimneys are said to be looked upon with great favor locally. The day after the new chimney at lighting plant was stripped of its false work it was exposed to the highest wind in Cleveland in eight years—sixty-six miles an hour. Notwithstanding this fact not a tremor was observed nor a crack apparent. W. J. Springborn, head of the city department, by which the chimney was built, made a personal inspection of the chimney and expressed satisfaction with it in every way.

On the night of February 12, fire did \$100,000.00 worth of damage to the big plant of the Ohio Ceramic Engineering plant, located on Berea road, near Cleveland. The concern is devoted to the manufacture of machinery for making cement blocks, industrial cars and brick. It is believed that the fire was caused by sparks from a passing locomotive. The plant was located some distance from the city and it was some time before a Cleveland fire engine reached it and started to play a couple of streams upon the burning buildings from a nearby pond. The large plant, which is practically ruined, was only partially covered by insurance.

The Cleveland Concrete Building Block Co. has reopened its plants after a two weeks shut down during which time a new concrete mixer and other machinery was installed. The capacity of the plant has been increased and the management reports that many orders have been booked.

Contracts for 1,000,000 barrels of sand for the construction of the Michigan Central tunnel under the Detroit River, at Detroit, have been let to the Detroit River Transit Co. The cost will be between \$80,000.00 to \$100,000.00.

IN THE NORTHWEST.

MINNEAPOLIS, MINN., February 13.—Building conditions are gradually resuming an appearance of activity, although the extreme cold weather which prevailed for several weeks served to discourage much progress in the early part of the season. The severe weather has been succeeded by milder, and the prospects are excellent for a good lively spring, especially if there shall be an early opening. The railroad blockade is still handicapping the movement of freight, and goods are hard to get moved, although the roads are making good progress.

Preparations in building lines show that the season will start with about the usual number of good sized buildings in view, if not more. There is no question that fireproof and fire-resisting construction are gaining steadily in the Northwest. In the Twin Cities for the past year, about a quarter of the work done was fireproof work, which is a good gain over all previous showings.

Building Inspector Houghton, of Minneapolis, suggests in his annual report that designers of reinforced concrete construction be required to undergo an examination before being authorized to engage in the preparation of plans for that class of work. The suggestion will meet with favor on the part of many who are sincerely interested and favor the use of reinforced concrete. They feel that it is a useful and valuable building material, when used as it should be, and that only when it is so used, can it prove satisfactory.

N. P. Peterson and R. T. Woodward, of Owatonna, Minn., have engaged in the manufacture of concrete tombstones, which are colored to resemble natural granite. They are said to have a process which produces a direct copy of the natural stone, and is capable of being carved and marked and worked generally.

The United States Gypsum Co. has moved its general Western sales offices from Fort Dodge, Iowa, to Minneapolis. F. W. Farrington, who recently was promoted from the charge of the Minneapolis office to general Western sales manager at Fort Dodge, retains that position, but returns to Minneapolis. The change is for the better field and more central location which Minneapolis offers for reaching the section included in the Western sales office. No changes are included in the force of officials.

THE WEST COAST.

SAN FRANCISCO, CAL., February 8.—The almost unprecedented period of wet and cold weather experienced by San Francisco and nearly every portion of California during the past month has retarded building work and caused a much smaller quantity of cement to go into actual consumption, than would have been used if there had been a little good weather. Notwithstanding the almost continual rains the aggregate monthly consumption of cement in San Francisco and vicinity increased during January and one out of a half dozen prominent importers of high grade foreign cement now reports daily sales averaging 1,000 barrels. This is principally for urgent work on building foundations and reinforced concrete buildings. The rains have prevented any considerable amount of work on cement sidewalks and sewer work, a great deal of which will be undertaken with the return of clear weather. If a supply of good cement at reasonable prices is obtainable this spring and summer great quantities of concrete work in these lines will be done.

During the month of January 78,759 barrels of foreign cement arrived at this port by sea. The arrivals during the first four days of February amounted to 55,572 barrels. While over 600,000 barrels of foreign cement is booked to arrive before the end of July, the dealers say they do not expect an over-supply.

The cement market is stronger and prices have advanced on the better grades of imported. Domestic cement manufactured in California is sold here at about \$2.65 to \$2.75, but the supply is limited. Within a few months when new plants now nearly completed are in operation the domestic article may be more of a factor.

Concrete laborers are receiving \$4.00 a day, while skilled workmen and cement finishers get \$5.00 to \$6.00.

A number of reinforced concrete buildings are now under way in this city, which have been considerably delayed in construction by the protracted rains. Strenuous efforts are now being made to utilize every minute of clear weather in making up for lost time. Within the next three months San Francisco will have several fine structures of this class as examples of what our architects and engineers can do with cement. Work is being rushed on the big reinforced concrete structure that is being erected at the southwest corner of Market and Fourth Sts. on the site of the old Flood Building. It extends through from Market Street to Pioneer Place. The basement is finished and the steel rods for the columns of the first story are in place. A number of arc lights have been installed and a night force of concrete workers has been put on, so the construction work can proceed continuously. Chas. F. Whittlesey & Co. are superintending the erection of this fine store and office building which they designed.

The Humboldt Savings Bank Building, which will be about the second building in the city in the number of stories of height, has been progressing well recently. The steel frame is up to fifteenth floor and the reinforced concrete walls have reached the eighth floor. It will be surmounted by a handsome dome that will be visible a long distance up and down Market Street. As the permit for the erection of this building was granted before the fire the new building laws can not be applied to limit its height. Several other large building projects are temporarily held up until the prospective owners learn whether the new building ordinance is to be modified so as to permit of the erection of a structure having a height of more than one and one-half times the width of the street it fronts upon. It is said that the proposed 23-story for the Hearst Estate upon the site of the burned *Examiner* building at the corner of Market and Third Streets, will not be commenced until the height limit question is definitely settled. It is to be hoped that the suspense will not be long continued, as the old site looks unsightly in the midst of the new buildings which are arising on every side in the immediate vicinity.

California Street will soon be able to boast of quite a row of fine concrete buildings. The Boyd-Alexander Building, occupying nearly an entire block of frontage on California Street between Front and Drumm Streets, has had three stories completed. Additional stories will be erected when needed.

The Woodruff Co., which has charge of the construction of a large building on the northeast corner of California and Drumm Streets, has the forms for the reinforced concrete foundation and basement walls in position.

Frank B. Gilbreth has completed the foundation and basement walls and has placed the forms for the massive first floor columns of a large reinforced concrete building at the northwest corner of California and Drumm Streets. He is trying hard to make up for lost time.

The California Concrete Co. is putting in the concrete foundation for a large business block on the northeast corner of California and Front Streets. The basement forms are in position for the 12-story Alaska Commercial Building, on the northeast corner of California and Sansome Street. It will have reinforced concrete walls, the lower stories being faced with stone. Just across Sansome Street, on the northwest corner of the two streets the deep excavation for the large Bank of California Building is about completed preparatory to putting a massive concrete foundation for the granite superstructure. Adjoining this building on the West, and fronting on California Street, the Woodruff Co. has laid the foundation and placed the first floor forms in position for a good sized reinforced concrete structure.

The B. & W. Engineering Co., E. D. Crowley, manager, with offices at 520 California Street, has completed a two-story reinforced concrete building, covering an area of 25x100 feet, at the corner of Clay and Sansome Streets for Edgar Paynter.

Among the recent applications for San Francisco building permits were included: A four-story brick structure with concrete foundations for E. L. Goldstein at the southeast corner of Sutter and Gough Streets, at an estimated cost of \$175,000.00; for an \$85,000.00 building on the northwest corner of Turk and Taylor Streets by the Woodward Construction Co., and for a \$50,000.00 building on Sansome Street between Clay and Commercial Streets, by J. H. Harris; for a \$25,380.00 brick building on Waverly Place by L. L. Fong.

Several of the Eastern stockholders of the Pacific Portland Cement Co., who have come from the East to attend the annual meeting this month, have been visiting the company's San Francisco offices and inspecting the additional cement mill at Cement, Solano County, Cal., which is about ready for operation. The capacity of the entire plant with the new addition in operation is about 5,000 barrels a day.

In Oakland, Cal., a great deal of building work is in plan, and ground has been broken for several large modern hotels, the completion of which will give the city more of a metropolitan air. Since the April disaster, Oakland, has ceased to be considered merely a suburb of San Francisco. It now has a mining stock exchange, and clearing house. A movement is on foot for the erection of a \$40,000.00 structure to be occupied by a builders exchange. Several large brick and reinforced concrete business blocks and warehouses are now in course of erection and a large number of residences and apartment houses are also under way. The new ten-story reinforced concrete building of the First National Bank, occupying the corner lot at the intersection of Broadway, Telegraph and San Pablo Avenues, is progressing well considering the weather.

The Southern Pacific Railroad Co. is planning extensive improvements at Fresno, Cal., at an estimate aggregate cost of \$100,000.00. The freight yards are to be enlarged and it is said that a new freight depot will be erected of concrete.

Considerable quantities of high grade Portland cement will be required in the construction of several projected light houses on the Pacific Coast. An appropriation of \$1,640,000.00 has been favorably reported by the House Committee on Interstate and Foreign Commerce for the Lighthouse establishment. The items in the bill include: A \$50,000.00 light and fog station at Carquinez Strait between San Pablo and Suisun Bays, in California, and a \$60,000.00 light and fog station on Molokai Island, T. H.

The Kingman Cement Co., which has been incorporated by J. D. Jordan and Charles Metcalf, at Kingman, Ariz., is capitalized at \$500,000.00. It is proposed to install a plant at Kingman for the manufacture of cement and also to manufacture stone products for switchboards and insulating material for electric lighting purposes. O. D. M. Gaddis, J. S. Withers and W. C. Rowman, are also interested in the new project.

The plans for the proposed Young Women's Christian Association Home in Los Angeles, Cal., provide for a 6-story building of reinforced concrete, which will contain offices, library, reading and writing rooms, gymnasium, dining-rooms and kitchen, club, class, board committee and rest rooms.

Elastic Roadbed.

Consul General Richard Guenther quotes the correspondence in a Frankfort paper from Zurich, Switzerland, stating that trials were recently made there of an elastic road covering invented by Street Superintendent Aeberli.

A section of Hohlstreet was covered with the Aeberli material. Many persons witnessed the trial, among them representatives of the municipal and cantonal authorities, who showed great interest. Two steam rollers were employed to smooth the road covering with the new macadam. Trials with a 6-horse wagon loaded with ten long tons gave a satisfactory result after the macadam had been sufficiently rolled. The macadam is prepared of gravel of a fineness of from 30 to 50 millimeters (millimeter equals 0.0394 inch) in diameter, and is freed of all earthy matter. This gravel is first heated in a specially constructed machine, and from a revolving drum is subjected to the action of liquid tar, so that each particle of gravel becomes covered with a coating of tar.

This tarred gravel is then put up in heaps, covered, and allowed to remain so from eight to ten weeks. It is asserted that during that period fermentation occurs which causes the tar to penetrate into the pores of the gravel and in this way lessens the formation of dust. In covering the road with this material the most painstaking cleanliness must be observed and dry weather must be awaited. No foreign matter must become mixed with the macadam. In rolling it no water must be used. The cost of preparing this macadam is small, 44 pounds of tar being sufficient for 1 cubic meter (28.38 bushels dry) of gravel; where limestone is used, 55 pounds. The machine is operated by four laborers and furnishes from 10 to 15 cubic meters per day.

TRADE ETHICS

Address of Charles Weiler, of Milwaukee, Before Columbus Convention of National Builders' Supply Association.

In being asked to address you on the subject of "Trade Ethics," I am forcibly reminded of the young mother who was anxious to learn all she could about the proper way to bring up a child, so she went for advice to an old lady of her acquaintance who had brought up a very large family of highly successful children, and asked her for the best method she could advise to guard the child's health, manners, and morals, for the entire period from infancy to maturity. The good old lady gasped at the size of the job, and threw up her hands as she said, "Laws, child! I don't know anything about bringing up youngsters, but you just go to my old maid sister! She knows more about how to bring up children than all the mothers in town!"

I think it is true that there is a general eagerness to give advice on totally unfamiliar subjects, in all trades and professions, notably so in politics and religion, and in talking to you of affairs that interest us in our daily business problems, I do so with frank admission that I am only one of the crowd at the foot of the ladder, looking up at the heights of knowledge, and hoping, but not expecting, to climb part way up the long and trying distance.

Our trade is fundamentally like all others. There is no Royal Road to Success! If there are in it any short cuts to wealth, I have never discovered them. If anyone has ever acquired a dazzling fortune strictly in the handling of building materials, I have never had the pleasure of an introduction to him, though nothing would please me more than to learn that my entire audience is composed of millionaires, with money to burn, and invitations to help them burn it.

Our trade has its sordid features, its daily trials, its commonplace problems, and, even when everything goes well, its modest rewards and inconspicuous and unnoticed success. Still, the great Law of Compensation, runs through our trade, as serenely and impartially as through every other line of human endeavor. If we do not reach lofty heights, we save ourselves many painful tumbles. If we do not succeed in breaking into the newspapers, we accomplish the far better result of keeping out of them. If we have made the mistake of selling lime instead of oil, and have failed to accumulate a warehouse full of gold, we at least have found stomachs (most of us), our heads have their proper covering (some of us), and we may occasionally, play a good game of golf (one of us) and John D. is not in our class, in any of these respects.

Great wealth with all its great drawbacks is certainly not worth having, while notoriety is still less valuable.

When Charlie Schwab first sprang into sudden newspaper fame and went abroad, he was introduced to the Emperor of Germany, who said to him, "I hear you are a great man in your own country, Mr. Schwab." "Well," said Schwab, "I have recently had occasion to doubt it. I was driving along a street in Pittsburg with my negro coachman, when, as he reined up to the sidewalk, I heard a woman turn to a little girl with her, and say, in a loud whisper, 'There is Mr. Schwab!' and the little girl looked inquiringly at both the nigger and me, and asked in a loud tone, 'Which one?'"

A Thoroughly Respectable Calling.

If the trade in Building Materials is neither especially noticeable or lucrative, it is, in all respects, a thoroughly clean, decent, and respectable calling. It has been identified from the beginning of history with all that makes for the world's progress, and the requirements of civilization. We have helped, in colossal degree, to make life more comfortable; to render existence possible in arctic snows, as well as tropic heat; to rear great cities full of palaces, as well as cottages; to attract the admiration and wonder of all the world for the amazing achievements of the American Builder, whose right-hand-man we must continue to be. We are justified in asking our several communities to notice, as did the Pharisee of old, that we are not like other men who are mere parasites,

and live upon the unearned increment of others' toil, but that we are model citizens; that we follow a highly useful calling; that we keep it free from just criticism; that our hands are clean and we live uprightly.

Like any one, or any tradesman who serves the public with the public necessities, we levy a toll which we call profit, on all these goods, and without which profit neither you, nor I, nor anyone else, could maintain an existence for ourselves, or those dependent upon us.

I am frankly and bluntly impatient with that class of chronic kickers who are constantly railing at their neighbors' profits, and carefully concealing their own.

As an illustration of this hideous propensity, I find in the October number of that curiously Yellow magazine, the Cosmopolitan, the following extract signed by one "Bailey Millard"

"It is bedtime. From room to room I go, locking the outside doors and the windows of my house. I twist the brass sash-fasteners tight, thrust home the bolts, turn the keys, click the door-chains into their grooves, and set the burglar-alarm. A house in my village was robbed last night, and I am seeing to it that my own is well secured. I shall leave the gas burning in one room, to trick all predatory prowlers into the belief that some of the household are still up or likely to return home at any hour."



CHARLES WEILER.

"Then, when all this is done, I laugh loud and long. For in the kitchen my eye catches sight of a piece of yellow paper on a hook—a bill for electricity consumed in the lighting of my house for the past month. I laugh, because in my conceit I thought I had locked all the robbers, and this bill calls to mind a systematic robbery to which I have submitted for years."

"There are other pieces of paper on the hook—bills for meat, for groceries, for coal, for ice, for gas—and they represent to me so many separate and distinct robberies, for in each case some thrifty thieves have banded together to extort from me the very highest prices for the necessities named on the bills."

"I laugh again! Somehow it amuses me tremendously to reflect that I have been most elaborately and painstakingly locking my house, year after year, to keep out robbers who could get in and steal from me easily enough if they cared to, while at the same time I have done nothing to bar

out the wide-working, insidious, and persistent bands of thieves that are filching from me half my substance in broad daylight every day of the week."

"The more I think of my lifelong nightly precautions against petty picklocks who never come and of my utter lack of preparation for protection against the grand larcenists who have so cloaked and dignified robbery that people, instead of putting them in jail, put them and their pals into high offices, the louder do I laugh."

At this point I am irresistibly reminded of Ikey Cohenstein and his brother Simon. They were traveling across the Atlantic and fell into the clutches of a party of card sharps who proceeded to trim the two Jews. Simon was the plunger, while Ikey stood behind the chair and kept urging caution, and telling Simon not to be foolish and bet so high every time he drew four aces, for the swindlers would then always show up a straight flush. Finally Simon lost every cent the brothers had, which so excited him that he fell on the floor in a fit, whereupon Ikey remembered seeing a Doctor's name on the passenger list, and so he rushed into the cabin calling, "Iss Doctor Smit here? I wants him quick!"

A man rose and said, "I am Dr. Smith. What can I do for you?"

And Ikey replied, "Oh! come quick, Doctor, my brudder he has a fit!"

But the Doctor answered with a smile, "I am afraid I will be of no use to your brother, as I am not that kind of a doctor. I am a Veterinarian."

"Oh!" said Ikey, "I don't care if you iss a Unitarian or a Presbyterian. Vot iss a Veterinarian anyhow?"

"Well!" said Doctor Smith, "a Veterinarian is a horse doctor."

"Sure!" said Ikey, "you iss just the kind of Doctor I wants! My brudder, he is a Jackass!"

Worthy Upright Citizens.

I would not trust in words the expression of the indignation I feel at this magazine's attack upon legitimate, honest, hard-working, tradesmen. We all know our grocer, or our butcher, or our baker, or any other tradesman who supplies us with our daily needs, at the customary low rate of profit which competition compels him to charge, and we all know, that, with rare exceptions, these men are worthy, upright citizens, hard-working men, fully entitled to such livelihood as each one of them can wrest out of the unpromising material at his hand. No right-minded man amongst us begrudges any one of them a cent of their necessary profit. I plead for decency and fairness in these matters, for the rights of the merchant as well as the consumer, for the square deal, and for the principle of "live and let live." I know that my butcher works long, hard hours for a very modest living. I know that my grocer meets, for a most inadequate return, daily vexations that would drive a yellow journalist out of his morbid mind. I know that these tradesmen fill a necessary and useful part in our daily surroundings, and are immeasurably better and worthier neighbors than are such critics, and I am glad to do my share to support them, where I would not give a cent to the men who try to stir up antagonism between classes.

We Building Material Men know only too well the strain and pressure of fierce, and often cruel, competition. We know how profits disappear when a field of trade reasonably large enough for one dealer, is invaded by a second, and a third, and a fourth, and the old harsh law of competition works its inevitable result.

Some of us may have known the bitterness of struggle and defeat, of the black day when the Bank, and the Creditor, and the Sheriff, closed down the business, and the work of a lifetime became worse than wasted. And the most fortunate of us all, know perfectly well that prices are fixed by competition; that an unreasonably high price can not be continued long without inviting ruinous competition; that an unreasonably low price will

just as surely ruin the business and throw it into the hands of its creditors; and that a moderate and fair price is the only possible way to make a success of any business.

In the face of this simple Kindergarten fact, the man who writes magazine articles classing the local dealers in all lines, with robbers and burglars, merely brands himself as part lunatic and part liar.

Nor can he escape the accusation by shifting the complaint onto "The Trusts." Personally I know little, and care less, about "Trust." Certainly I am not called upon to defend them; yet I feel certain that there never was, and there is no danger that there ever will be, a trust that will dry up all competition in any article that any one can produce.

Above every effort of man to change the inexorable laws of trade, higher than the Law of any Government on earth, is the one great, portentous, irresistible Law of Supply and Demand. Depend upon it, my brethren of the Building Material Trade, when any article is over abundant, you can buy it cheap, but you will have to sell it cheap. When any article is abnormally scarce, you will have to pay high for it, and you can get a high price for it. Between the small profits on the large sales, and the large profits on the small sales, in the long run you will come out with about the same result. This fact is not going to be changed in the slightest degree by all the howls of the Yellow Newspapers and all the cheap-skate politicians in America.

In my business I have occasion to buy oil of various grades. Now, as everybody is supposed to believe who reads daily papers, there is only one source of supply for oil—that dreadful octopus, the Slandered Oil Co.—to whom you must go for all your oil and pay their robber price, or else go without! It was something of a revelation to me to see the wild scramble for orders that ensued when it became known that I wanted a few lots of gasoline and lubricating oils. There were literally dozens of oil concerns after the business, each one bragging of their independence, and adjuring me by all that I hold most sacred, to buy their low quality goods at high quality prices, just to show my hatred of the Standard Oil Co., and my love for any one who is "Not in Any Trust."

Well! now, I am not built that way! I have a holy horror of humbug! It has been my experience that the man who blatantly advertises that he alone is "Not in Any Trust," needs a good deal more watching than the Trust itself.

My observation of the workings of Trusts long since convinced me that they were evolved out of the stress of bitter competition; that the manufacturers went into the various Trusts reluctantly, but as a necessary evil, and to save their investments and their properties; that no sooner had the Trust begun to earn reasonable returns than the smell of profits attracted the sharks that infest the ocean of trade; that the sharks built black-mailing mills, and forced the Trusts to buy them, and with the exorbitant amounts squeezed out of the Trusts, built more mills, and again sold them, and so on, ad infinitum! And thus the harried, and badgered, and bedeviled Trusts have grown too heavy, and sick, and they walk the floor nights in a way that none of us need envy.

The facts are that all Trusts are, like all individuals, subject to the same inexorable law of Supply and Demand. Competition lives! It can not be killed! Every tub will stand upon its own bottom! Every stream will find its own level! Every Trust, in its own fore-ordained time, which we can neither hasten nor delay, will disintegrate and disappear, and the Trade will start all over again.

The puny efforts of man to interfere with the currents of trade and the forces of Nature's laws, will amount to nothing! Efforts to gain temporary profits by agreements between competitors, will rise and flourish, and then will fall, and will be succeeded by fierce fighting and business wars; that will, in turn, again be patched up, and the old round gone all over again, and in spite of all the laws that can be spread upon the Statute Books from Bangor to Seattle, and from Duluth to New Orleans.

I can not bring myself to believe, for example, that we have anything to fear from a Portland Cement Trust; rather do I feel that such Trust would add stability to the trade, and would benefit dealer and consumer alike, and I am inclined to regret that there is no probability of any such combination of interests.

You are all familiar with the dirty attacks of certain newspapers upon our trade, in the shape of crude pictures of a poor little six-inch high dwarf, labeled "The People," being clubbed by a beastly looking monster called "The Cement Trust." It is trying to one's patience and good nature to see these things, knowing as we do, that they are silly lies, and are known to be lies by the cheap hireling who produces them, but we also realize that the average consumer does not know the truth, and is easily imposed upon by the contemptible political cockroaches who would not hesitate to wreck any and every legitimate business if by so doing they can gain votes from shallow and deluded voters.

In view of this continual harping upon a bogey "Cement Trust," which does not exist, I ask your attention to the report upon "The Cement Industry in the United States" recently issued by the Department of the Interior, and which your member of Congress will mail you upon application. On page 4, you will find the following statement, and I ask you to compare Mr. Edwin C. Eckels unprejudiced and official truths, with the infamous yellow lies of certain newspapers.

Mr. Eckel writes as follows:

"At intervals an excited and not particularly well informed newspaper press inveighs against the enormous profits realized by a purely imaginary cement trust. To those acquainted with the highly competitive nature of the cement industry, such denunciations may seem too absurd for denial, but there is reason to believe that they are accepted as true by the general public. It may, therefore, be of advantage to state that there never has been a cement trust in this country and that there seems to be little opportunity for arranging any satisfactory combination of the cement producers.

"The nature of the industry renders it improbable that any combination or non-competitive arrangement can be carried through to such a point as to result in a monopoly of the industry and permanently high prices. Good raw materials are so widely distributed throughout the United States that there is hardly a county which could not produce Portland cement if prices were forced high enough. The only limitation now on the erection of cement plants is the fact that they cost too much for an individual or a small firm to enter the business. A plant producing 2,000 barrels per day will require an investment, for land, plant, and working capital, of between \$1,000,000.00 and \$1,500,000.00."

As for the lime trade, being a manufacturer, it would not be proper for me to express myself further than to say that I know of no field of endeavor, absolutely none, that pays so meager and unsatisfactory returns to the men who have their means and future prospects tied up in that enterprise.

Right here in Ohio the average kiln price per ton in 1905 was \$3.23. In my own State of Wisconsin it was \$3.38. In Indiana \$3.45. You can get the entire table of these figures by asking your member of Congress to send you the pamphlets issued by the Department of the Interior—U. S. Geological Survey—on the Production of Lime, also the Cement Industry in the United States.

The manufacture of lime, at these figures, I do not need to assure you, is a very unattractive proposition. It is a badly overdone business, the supply being enormously in excess of the demand, and the growth of the wall plaster and Portland cement trade in the fields formerly occupied by lime, makes the future of the lime manufacturer anything but cheerful.

The lime trade is an old, respectable, well handled and thoroughly reasonable one, and in all my experience as a member of your executive committee, I do not recall ever having heard a solitary complaint against a lime manufacturer from any of our members.

Personally, I am rather proud of this showing, for it proves the contention of this association that the retail dealers' rights are of first importance, and that the manufacturer who has learned wisdom from years of experience, gradually works around to this conviction.

Some Points for Consideration.

In view of the peaceful and harmonious relations existing between us, as dealers, and the general body of lime manufacturers throughout the United States, and also of the contrasting fact that there is more or less discord in our relations with the Portland cement trade, I realize that their defense

is not properly my business, yet there are a few points I feel justified in asking you to consider.

The Portland cement trade in America is very young, and to those of us who have been through the period of English brands, changing to the better German cements, and have seen the first feeble beginnings of the American article growing with amazing rapidity, into its present colossal proportions, it has always been the most astonishing and interesting infant the building material trade has ever known.

Now we, all of us, excuse and overlook, on the ground of youth and inexperience, many things in a child which would be unreasonable and undignified in the mature person. It is not given to many of us to be born with the wisdom of Solomon fully developed at birth, or, like Minerva, to spring full armed from the brow of Jove. Rather do we learn wisdom through blunders, and stumbles, and trials and losses, and struggles, and defeats, and in the hard, and bitter, and cruel, school of experience; but the man who has gained his education, and received his degree, from the University of Hard Knocks, is best enabled to judge of the efforts of others struggling along the same old rocky road.

Let us be patient with some of the mistakes made by some of the cement manufacturers on the ground that they are still learning. Nearly all of them are able, strong, reliable, wise business men, each in their natural field, but to many of them, the retail field is as little understood as is the production of millinery, or chocolate caramels, or Parisian lingerie, to any of us rude and rough and rugged men.

Many of you have been up against this fierce proposition occasionally, since the upward course of Portland cement prices set in early in 1906. Your neighbor and competitor is buying a certain brand of cement at an open and well known figure, well known both to you and your own source of supply; yet you are charged a higher rate, and in response to your appeal to be kept upon the level of legitimate competition, you are informed that it is unnecessary, with long drawn out arguments proving that two and two sometimes makes four, sometimes five sometimes any other old number.

A man once went into a saloon, called for a cigar and when he got it said to the bartender, "I have changed my mind and would rather have a drink instead, if you don't mind."

"Certainly," said the bartender as he put back the cigar and set up a drink, which the customer tossed off and started for the door.

"Hi, there," said the bartender, "you didn't pay for that drink!"

"Why! I gave you back the cigar for it," said the man.

"Well, then! pay for the cigar," was the natural reply, but the man indignantly answered, "You have got your cigar! Why should I pay for it?"

(The way to collect that debt would be to use a bung-starter.)

I think, gentlemen, you will all agree that the necessity of meeting legitimate competition is a plain, simple, fundamental, elementary, kindergarten fact, and none of us can do business successfully on any other basis, and when the manufacturer who supplies us, denies it, and argues against it—well! all we can do it to possess our souls in patience, until the inexorable logic of events opens their eyes to the fact that they have made a mistake and they will change their position!

Let us praise God in a fierce voice because the building material business is not handled on department store ethics. So far as I know, we have no bargain counters, or special sales days. We do not sell cement at three dollars a barrel on Mondays, ninety-nine cents on Tuesdays, four dollars on Wednesdays, and give it away with a trading stamp thrown in on Thursdays. That may be good policy for dry goods, but I am old fashioned enough to think that it would be an asinine policy for any of us.

I have been asked, "What is legitimate competition?" The answer is simply the well known railroad tariff formula, "Under similar circumstances and conditions." That covers the case completely.

Illegitimate competition is illustrated in the old story of the conversation between the lady and the meat market man.

"You shouldn't charge me fifteen cents a pound for sausage, when your neighbor only charges ten cents!"

"Is he selling sissage today for ten cents?"
 "Well, no, he hasn't got any today, but he says that is his price."
 "Well, ven I don't got no sissage, I sells him for ten cents ahiso."

There is one feature about our intercourse with our various sources of mill supplies, especially with the Portland cement mills, upon which I feel moved to express a somewhat personal opinion, though with all deference to any contrary ideas there may be present.

I do not understand, and I do not like, the idea of there being any ground for hostility between the dealer and the manufacturer, as if we were arrayed in two hostile camps, carefully watching each others' moves and tactics, ready to fight at the drop of the hat, and trying to take advantage of each others' mistakes.

Every gain of that kind, enforced by either side, is an ultimate loss. It does not pay. We are friends—not enemies! We are necessary to each other! When we form an alliance with any mill to represent its goods, we become partners together in the enterprise. Our interests become entwined, and entire harmony becomes essential. No alliance, no purchase and sale, no business connection of any kind, can be permanently successful, unless it is based upon mutual self-interest. A proper and cheerful sharing of the burdens, and inequalities, and losses, and crosses, of the business by both sides, is just as essential as a fair division of the profits.

At the joint conference in Atlantic City between our committee and the Portland cement manufacturers in June, 1905, I prefaced my remarks with the following sentences, which I beg your indulgence for repeating here.

"It is but fair, at the outset of the argument, to ask you gentlemen to rely upon our assertion, that we are 'safe and sane,' that we are practical, conservative, level-headed business men, and that we recognize the unalterable truth of the fact, that any arrangement, agreement, or other solution of the troubles which now vex the trade, *must be founded upon the bedrock of mutual self-interest*, in order to be enduring, and that if we, as an association, should succeed in getting you gentlemen, as manufacturers, to act contrary to your own interests, such would be too temporary and evanescent to be of the slightest value to us on our side of the question."

"We simply seek to convince you that our interests are identical, and that the dealer, as the right hand man of the manufacturer is his nearest and closest friend; and that anything which benefits the manufacturer, is of immediate benefit to the dealer, while in the manufacturers' period of adversity, the dealer suffers simultaneously."

"Neither of us could alter this fundamental truth if we would. For good, or for evil, we are bound together upon the Wheel of Progress. We rise, we fall, and rise again, together; and like a well-mated couple, the quicker we outgrow our little spats and harmoniously take up the burdens of life, each doing their full share, and cheerfully carrying their proper proportion of the daily grind, we will surely become nearer and more necessary to each other, as time goes on, and we steadily approach the end of all Life's Problems."

Enormous Strides are Made.

Nearly two years have passed since this conference, and it is natural that we should look back to the conditions which surrounded the Portland trade at that time, and ask what progress has been made along the lines of protection and respect for, the natural rights of the established dealer.

I stand here to assert positively, and of my own knowledge, that the National Builders' Supply Association has made enormous and highly gratifying stride during that time, in the direction of its legitimate objects.

It may not be apparent in equal degree to all of us, at all times, and in all places, and I do not claim that our work has been fully accomplished, for if it were so, we would be ready to disband, but it is equally true that we, as a body, are growing steadily in the respect and confidence of the men from whom we draw our supplies.

I know of one Portland cement mill that carries on its letterhead the inscription, "We sell to Dealers Only." No one member of our association caused that line to be placed on that letterhead. Rather it was caused by the inborn business conscience of its owners that along the line of respect for Dealers' Rights, lay its best interests, and its largest financial rewards, and this is the

line of argument that goes straight to the heart of the question.

I never have bought a cents worth of the cement made by that mill, indeed, I have often found it taking sales away from me, but it is following along the right road of Trade Ethics, and it commands and receives my heartiest respect, and I am justified in asking your mental applause for it, and all other mills, who are handling their sales in the same way.

At two of our early conventions, a certain Eastern mill was the general target for fierce complaints of our members, because of their disregard of Dealers' Rights and of their methods of pushing their cement through widespread quotations addressed indiscriminately to all sorts of buyers. I was one of the few who stood up for this mill, because I knew that its owners were upright and square, and could be relied upon to do the fair thing by every interest, when they could be shown where they were injuring our members unnecessarily.

Now let me call your attention to the change which has come to them in their attitude towards us as dealers.

In the October pamphlet issued by this mill, addressed to consumers generally, I find the following words:

"Practically all our cement is sold through dealers. We can undoubtedly serve your contractor at any point from some responsible dealer's yard."

"A postal card will give you our dealer's name in any town or city east of the Mississippi River."

Gentlemen, I am proud of that extract! Not because you, or I, or any of us, inspired it, for none of us had anything directly to do with it, but because it is a high and living proof that our principles are marching on to deserved victory.

I know of another mill, who once considered our association of so small importance as to be unworthy of their notice, and yet at our executive committee meeting in Minneapolis, last July, I read a letter from this same mill, asking if a sale of their cement to a certain buyer would be considered in violation of our position on the subject, as an association!

Is not this a victory for our methods, as well as our principles? I firmly believe it is!

I know that we have treated the subject of Trade Ethics and Dealers' Rights from the true standpoint of appealing to the good sense and the enlightened self-interest of the manufacturer, and I am as certain as daylight that our methods have had the right and the legitimate results, and that we have achieved by courtesy, commonsense and conservatism, what we would have ruined by bluster and retaliation.

Our policy should be to get together with the manufacturer, to be his friend and assistant; to make his interests our own, just as we want him to care for our interests; to bear in mind that both parties to any transaction must gain by it and that any other kind of a deal can not possibly be permanently successful.

Even with the best of feeling between the buyer and seller, accidents will happen, misunderstandings will arise, ill-will may spring from some carelessly worded and easily mistaken letter; but the bad effects of these frequently recurring troubles may be minimized if the feeling between the parties is based upon the confidence earned by a royal adherence to the principle clearly embodied in the Golden Rule, "Do unto others as you would others should do unto you."

Certain Elementary Truths.

Turning toward the conduct of our daily affairs, there are certain elementary truths in the transaction of our business that applies to all trades, and that we can not afford to ignore.

Honest weights, reliable measures, and square treatment of customers always pays best. I do not want to be understood as repeating the remark of the business man who said, "I know that honesty is the best policy because I have tried both," but it is a fact that the pleased and satisfied customer is the one we want to get and hold, and we are willing our competitors should have the rest. The dealer who has earned the reputation of being square and straight, will live and flourish, and will be able to attend the business funeral of the competitor who is always looking for a chance to get ahead of his customer.

Insurance is a subject apt to be overlooked or to receive scant attention. Every man should carry adequate insurance and not feel that it is money squandered when he escapes without a fire loss. Still I would not recommend the attitude of the

Jew who met a friend in the synagogue one Saturday and extending his hand in a congratulatory way, said, "Well! Ikey, I hear you had a big fire last night." "No! No!" replied Ikey, "Not until next Friday."

Patience is also a good thing to carry in stock, and in large quantities. It is never so badly needed as when the average drummer calls on you and harps by the hour on the superlative quality of the article he sells. It is always better than any other brand, and he proves it to you in a hundred ways! Make allowances for him! It is natural talk! They generally believe it themselves, but it is dreadfully tiresome, and gets on your nerves to have them all sing the same old song. Have patience!

"Bad debts" constitute our very worst problem; a problem which will not be solved this side of the place where golden harps constitute the principle stock in trade. The dead beat we have always with us. A percentage of mankind, too lazy to work for an honest living, and too much in fear of the law to steal, will always live upon the misplaced confidence of others. The only thing we can do is to spot these creatures, and keep them at arm's length.

If there is any remedy for the evil of bad debts I never have discovered it. Probably none of us could figure out if we tried, whether an excess of caution in granting credits was good or bad policy. We all know men financially irresponsible who are gilt-edged pay. We also know men and firms once rated high in Dun or Bradstreet, who were notorious frauds, watching their chance to lay down on some one for all they could grab.

The United States bankrupt law, unfortunately, furnishes a harbor of refuge for lead-beats. I do not feel like criticising a law that came from a former chairman of the judiciary committee of the House of Representatives at Washington, Judge Ray, of New York, an old schoolmate of mine, and a man for whom I have the highest personal respect.

Perhaps it was the best solution obtainable at the time, of conditions that had become well nigh intolerable, in the absence of any national banking law, and the presence of shifty, confusing, and widely divergent laws of the several states.

It is undoubtedly both just and reasonable that the honest and unfortunate debtor should be entitled to protection from extreme prosecution. But, the law should also have provided for some omniscient, all-wise person, who would know almost as much as a modern magazine muckraker, and who would distinguish for us the difference between an unfortunate debtor, and a worthless one, turning the first one loose, with some kindly advice to try again, and setting the other one at work in a penitentiary.

The subject of cash discounts is often ignored by responsible dealers, generally, on the ground of carelessness, or what I might impolitely call, mental laziness. One, two, and even three per cent discount is allowed on the goods we handle and the earnings from that source frequently pays more than the office expenses of a dealer. Any bank will be glad to loan money at present to a responsible dealer at 4½ to 6 per cent, while the manufacturer is willing to allow him 12 per cent or more. The dealer may as well owe his local bank for his stocks and pocket the difference. The bank needs a good borrower as well as a good depositor. The mill needs a cash buyer, and the man who always discounts his bills is a highly acceptable customer. From every point of view, the subject of cash discounts deserves the attention of every dealer who may have ignored it.

In conclusion, I have felt some hesitation about adding a word of warning to you about the time of trouble which I feel is looming up in the distance before us all. The man who goes about predicting calamity, fills an ungracious part and may well hesitate before exposing himself to the jeers of the incredulous now, and the derision of others, should his predictions prove to be as ill founded as are many of our daily weather predictions.

And yet, because we are all brothers in the same trade, and because a word of warning may cause some one of us to "put his house in order" and prepare for the coming storm, is why I feel it a duty to express the opinion that the business interests of the United States are in danger, and that we are going to plunge into a panic in 1908 that will shake the whole country to its financial foundations.

The first man I bump up against with an entirely different opinion, is our mutual friend—
 (Continued on Page 56.)

Builders' Supply Men Meet in Columbus.

The eighth annual convention of the National Builders' Supply Association was called to be held commencing Tuesday morning, February 5, 1907, at 9 a. m., in the Convention Assembly Room, on the seventh floor of the Southern Hotel, Columbus, O., and finally about 10:15 o'clock, the meeting was called to order with President Gordon Willis in the chair and Harry S. West, secretary.

The President: Gentlemen—We have some very distinguished men with us today to welcome us, and I will have Mr. Rhoads, the chairman of the Committee on Arrangements, introduce the gentlemen.

Mr. Rhoads: It gives me great pleasure to introduce to you, Mr. Andrew L. Harris, the Governor of the State of Ohio, who will make the opening address.

GOVERNOR HARRIS' ADDRESS.

Mr. President, members of the National Builders' Supply Association and ladies: I am sure that it is a great pleasure for me to have the opportunity of coming here this morning to meet you on the opening of this convention. I am sure that the State of Ohio is proud to have you in her midst. We appreciate your importance as an association. We know the amount of money that you have invested in building supplies, which is necessary to keep up with the procession. We know also that you are in the front rank in the finding of the best materials for the construction of our buildings, and in supplying that material when it is found, Ohio is in advance I might say, of any State, in the construction of fine buildings. Therefore, I repeat that we are proud to have you in our midst.

I am not going to try to make a speech. I know that you know what your business is here and I will not take up your time on these lines. I only desire to welcome you to the State of Ohio; to say that the gates are always open to you and that we are always glad to see an association such as yours. I want to say to you in addition, that I extend to you an invitation to visit any and all of the institutions of Ohio, and especially those grouped around the city of Columbus, which are easy of access, and any courtesy that I can extend to you in the visiting of any of our various institutions, will be extended as cordially as it is possible to do, because I take great pride in our various institutions and feel that they are worthy of your inspection. To any institution that you desire to visit during your session here, I will be glad to give you the keys for the time being.

Now, again, we welcome you on the part of the State and hope you will have a profitable and an interesting session. I know you will, because you have come here for business, and feel that you will transact that business before you separate. Gentlemen, I thank you.

ADDRESS OF WELCOME ON BEHALF OF THE CITY OF COLUMBUS.

DEWITT C. BADGER, MAYOR.

Mr. Chairman, Ladies and Gentlemen members of the National Builders' Supply Association:

You are thoroughly welcome to our city. It does Columbus good to have an association of this kind meet within our arms; an association representative of men who are alive to the progress of the times, pushing the building of great structures to the front and making these great strides of rapid improvement that so mark our civilization.

Men like yourselves, who have been in the front rank of civilization, and men who are furnishing the material and aiding us in making the improvements that make homes, buildings and cities so substantial and so beautiful, are the men that we are glad to have with us today.

In the spring we like to welcome the robins, wrens and sparrows. They build every year, but have made no improvements in the last 2,000

years. They are nice little fellows who are happy when they sing, but after all, I do not think they have any better time than the members of the National Builders' Supply Association. You are making advancement while they are singing. The strides you have been making along building lines have been most wonderful and have added to our progress as much as any other branch. I know nothing that has added so much to the upbuilding of our great cities as associations like yours. In the building up of such cities as St. Louis and others with their millions of inhabitants it shows a line of progress that needs to be guided by brainy head and steady hand and such an association as yours adds largely to the intelligent and progressive building up of these great communities. I will not detain you, however, to dwell on these lines which you know better than I can tell you.

You are surely welcome to this great city. I was glad to hear the remarks of Governor Harris that you were welcome to the State of Ohio, and I hope you will visit the State Capitol where our Governor presides so well and so satisfactorily to the people of Ohio. That's what we think is the center of Ohio, and if any of you doubt that it is the center, the Governor will have some one take you up into the dome of the capitol where you



GORDON WILLIS, ST. LOUIS, MO.
PRESIDENT OF THE ASSOCIATION.

can look out and see the horizon as it comes down equally on every side. Now, while you are in this center, we hope you will have a good business meeting, but do not confine yourself entirely to business, because all work and no play makes Jack a dull boy, and I don't see any dull faces in this crowd. While you are in Columbus if there is anything you want and do not see, ask for it. If there is anything you do see and want it, take it. It is yours.

RESPONSE TO GOVERNOR AND MAYOR.

BY PRESIDENT GORDON WILLIS.

Our association was unfortunate in selecting for its president one not gifted with eloquence or the ability to properly express the sincere appreciation of its members for the honor of being welcomed by the distinguished gentlemen who have just spoken so kindly and earnestly. We are much flattered, as well as highly honored to see that our

organization, though small in members, is considered of sufficient importance to receive so cordial a greeting as has been extended by the State of Ohio and city of Columbus through their highest officers.

We were urgently invited to hold this year's meeting at several other cities but there was little hesitation in deciding on Columbus. Your city has a reputation throughout the entire country as a convention city and I believe that more conventions and meetings of a general business character are held here than in any other city in the United States in proportion to the population. This is not due solely to the central location of the city and its easy accessibility to other cities, nor is it on account of its beauty as a city, its excellent streets and magnificent parks, its modern hotels and general up-to-date manner of appearance, but more than anything else it is due to the cordiality, the hospitality of its citizens, the wide open arms and the hand of welcome. This is the reason why all those who come here go home full of gratitude willing and anxious to praise your beautiful city. I have been told that you emphasize the fact that Columbus is a city of level streets and that one horse can pull or carry a larger load on the streets of Columbus than four horses can in the average city. My experience and information is that the citizens also are on the level, if I may use the slang expression that fits the case. But if that assertion as to the ability of the horse to carry a load was also intended to apply to the citizens of Columbus as compared to the men of other cities then I confess ignorance.

Gentlemen, I thank you in the name of our association and every member for your kind words of welcome.

ADDRESS OF WELCOME ON BEHALF COLUMBUS BOARD OF TRADE.

JOHN Y. BASSELL, SECRETARY.

Mr. President, Ladies and Gentlemen: After listening to the remarks of the distinguished gentlemen who have just preceded me, I feel very much like the fellow who came from an Eastern city where the punishment for a capital offense was hanging. He had heard that a man had committed murder in Ohio and asked, "Will they hang him?" The little fellow replied, "Naw, they will elocution him to death." I therefore feel that to make a speech would be "elocutioning" you to death.

Seriously speaking, I am called upon frequently to welcome conventions to Columbus. Columbus has grown to be a great convention city, and I am not unduly sounding the horn of the city when I say that we have so many conventions annually in Columbus, that we might claim to have an average of one a day. I will say to you in all sincerity that I have never been called upon to welcome a convention in which I had more positive heart than this one. In the first place, you come to us in a pleasing sort of a way. We are much indebted to you for coming to us in view of the cities that have been in competition or in rivalry with us. For instance, Toledo has always been recognized as a sort of rival sister city. The rivalry is not of an unpleasant kind; just simply two ambitious sister cities striving to outstrip each other; that's all there is in that rivalry.

Now, gentlemen, you are a distinguished body because your interests are those of building, and throughout this great country you are more closely associated than any other body in what we are constantly looking to for the confidence of our prosperity and our growth, and when we see the sky-scrapers of the modern city, we know that the builders' supply man has been adjacent thereto. We are certainly glad to have you with us.

The President: Mr. Hunter was expected to respond, but I have just been advised of Mr. Hun-

ter's serious illness and his inability to be present. I will therefore call on Mr. Richard Kind:

RESPONSE ON BEHALF THE NATIONAL BUILDERS' SUPPLY ASSOCIATION.

BY RICHARD KIND.

If a year ago at the meeting of this association, any one would have told me that we would be here at Columbus today attending this meeting, I would have imagined that that person was a joker. I confess I was not present when the eloquent representative of the Columbus Board of Trade presented the claims of this city before our Philadelphia meeting. I was told that his address was the best and most convincing ever made at any of our meetings.

To be frank, my home city and Columbus never got along very well. Personally I was in a position of being concerned years ago in a certain matter of legislation which interested our city very much. We were given a black eye and imagined that the citizens of Columbus were at the bottom of the thing. At that time, I vowed that I would never come to Columbus unless I was forced to, and this would have been in company with our sheriff on the way to the penitentiary. I managed to stay out of that institution, however. Can you blame me then that I voted against Columbus when the selection of a meeting place was considered by your executive committee?

To be consistent with myself, I asked that my vote be put on record as against Columbus. As a punishment, I believe, our president made me a member of the Arrangement Committee and naturally this compelled me to come to Columbus. If the president had the intention of actually punishing me, he failed and I take this opportunity of thanking him heartily because he gave me a chance of becoming acquainted with the business men of this city. I was agreeably surprised to find these bodies very much alive, quick to respond and ready to co-operate.

The Board of Trade is wide awake, ready at all times to welcome a stranger and extremely fortunate in having a secretary who would fit any place and be a valuable man in any city.

Our colleagues, the builders' supply men, took hold of the work and the results achieved by these various committees will be seen as this meeting progresses. The members of the association appreciate this and in their behalf I extend thanks to the people of Columbus, and especially so to the ladies and gentlemen who interested themselves in the work of this convention.

Personally I have to apologize and am glad to have the opportunity of doing so. Without mentioning the natural facilities of Columbus as a convention city, I have learned that its citizens are warm hearted and deserve praise, and whether or not you Columbus people may call Toledo "The Frog Town," whether or not your ball team may again take the pennant from us during 1907, whether or not you may continue to call our teams "the Mud Hens"; whether or not your newspapers may claim that your postoffice sells more postage stamps than ours, and that your bank clearing house does more business than ours; whether or not you may claim that the number of your inhabitants is greater than ours—you can rest assured that in future I will always speak a good word for Columbus and its citizens, and I feel that I wish to return to this city, as every member of this association will be glad to do.

Governor Harris: I wish to announce in addition to what has just been said, that the badges of this association will be a pass into any institution in the State, and when I go back, I will inform the warden of the penitentiary that the badge will not only take you in, but will bring you out again.

The President: We have omitted one response to these speeches of welcome to Columbus, and if there is any member who would like to express himself on this line, we should like to hear from him before the meeting is adjourned.

Mr. Fairleigh (Louisville, Ky.): I want to say that it is with great pleasure that I come to Columbus as a representative of builders' supply men south of the Ohio River, and I think that at the next meeting of the association that the number of representatives from my side of the river will be much greater.

The meeting, on motion, adjourned.

EXECUTIVE SESSIONS.

The meeting Tuesday afternoon was given over to an executive session of the association at which only members of the association were present. The feature of this meeting was the annual address of President Gordon Willis, which is given in full as follows:

ANNUAL ADDRESS OF PRESIDENT.

BY GORDON WILLIS.

Our last annual meeting was held in Philadelphia just one year ago. Since that date our membership list has been considerably increased and for the benefit of the new members I will dwell briefly upon the objects of the association and what has been accomplished.

I quote in part from our Declaration of Purpose: "We seek to promote closer acquaintance among building material dealers and manufacturers; to protect ourselves against those unfortunate misunderstandings so ruinous to the prosperity of the trade; to act in unison on all matters of mutual interest, in any manner not in conflict with the laws of the land; to disseminate among building material dealers and manufacturers a better knowledge of all matters pertaining to the

adjusted amicably and fairly to the satisfaction of all concerned.

We must not lose sight of the fact that in times of prosperity when the manufacturer as well as the dealer finds a ready market for his goods that naturally there is less temptation for either to overlook the rights of the other. In prosperity the principal difficulty the manufacturers and dealers have is getting the goods. But it is when dull times come, when every thought and effort are exerted to sell goods, that we are inclined to close our eyes to the rights of others. It is then that the good work that has been done by our association will best be seen. The manufacturer and the dealer have become acquainted; they know and respect each other. I feel that the confidence that has been established and is strengthened each day will greatly lessen conflict, dissatisfaction and unpleasant differences that have arisen in the past.

There is another result accomplished by this association equally as beneficial as the subject I have just referred to and that is the opportunity each of you has to become acquainted with many men in your own line of business. My personal experience is that I have gained many good ideas from other members and I have found them all willing and anxious to promptly talk over any sub-



GROUP OF BUILDERS' SUPPLY MEN ON THE SOUTH STEPS OF OHIO'S CAPITOL.

trade and other propositions looking to a greater economy in our business."

I speak with a personal knowledge when I say that we have accomplished that which, in my opinion, is the most important of our purposes, viz: a better feeling and understanding between the manufacturer and dealer. Each recognizes that success and profitable results are more easily obtained in working harmoniously together. If nothing else has been accomplished by this organization than that of getting closer to those from whom we buy, the manufacturers, showing them that we are working for their interest as we are for our own, that our success means theirs, then gentlemen, I say that that is alone sufficient reward. To my mind this result has been attained. In my official position I have had many instances brought to my attention showing clearly that the just rights of the dealer are recognized and respected. This condition has not been attained by threats or endeavored intimidation, but on the contrary by a frank, reasonable and business-like discussion of the subject. I believe I am not mistaken in stating that no case of complaint or difference has arisen which has not been

subject of mutual interest. There is a brotherly feeling created and an atmosphere of good fellowship prevailing that rather invites one to give to his associate members the benefit of any knowledge that he has obtained.

A maxim which has been frequently used in our organization is the old one of "Live and let live." I am not certain that we all follow this doctrine. Are not some of us prone to act before we think? And to complain and charge others with misdeeds without endeavoring or desiring to hear the other's side and do we not sometimes make a "mountain out of a mole hill?" We should and must be broad minded and recognize the fact that others have rights. I have found from experience, the best of teachers, that a desire to be reasonable and to meet the other man half way will accomplish quicker and more satisfactory results than other methods. I am convinced that purely as a matter of business not of sentiment or fear, that the manufacturer recognizes that the dealer, as his best customer, should be his best friend. Let us by our acts strengthen that feeling; that we are not only his friend but one of his family worthy of his trust.

There are many other matters in addition to those I have referred to that would naturally come up at our meetings. May I not suggest that each member go to the annual meetings not only to learn but to teach as well. Let him be prepared to bring up for discussion some subject the adjustment of which not only benefits him but his fellow members as well. Don't leave to a few the handling of all subjects. Join in and work for the success of the meeting and the welfare of the association.

I will not take up any more valuable time as we have a number of eloquent speakers to hear from and who will interest you far more than I have.

Before closing I want to extend my thanks to the members of the Executive Committee for their untiring and unselfish work; they have traveled hundreds of miles and have taken valuable time from their business to devote to the interest of this organization. I also want to express my sincere appreciation and recognition to the exceedingly good, thorough and earnest work of Secretary West. He has labored constantly and most wisely to the benefit of the organization and has at all times proven to be the right man in the right place. Gentlemen, I thank you for your indulgence.

REPORT OF SECRETARY WEST.

We have assembled again for the purpose of mingling together on the occasion of this, the Eighth Annual Convention of the National Builders' Supply Association, and, as secretary of your organization, it affords me great pleasure, I assure you, to submit for your consideration my first annual report. In view of the fact, however, that I am not possessed of the oratorical ability of my worthy predecessor, and, for fear you might be anticipating an address couched in the flowery language for which he is noted, I deem it advisable to say at this time, in order that you may not be disappointed, the report I am about to submit will be devoid of the feature which I have just mentioned.

At the opening of the Seventh Annual Convention you had a membership of 134 active members, and, during the session applications from the following firms were acted favorably upon: The Duncan & Porter Co., Allegheny, Pa.; Peterson & Wright, Akron, Ohio; Strunk-Meyer Lime Co., Cincinnati, O.; J. J. Mandery, Rochester, N. Y.; Fairmont Wall Plaster Co., Fairmont, W. Va. Making a total of 139 members at the close of the Seventh Annual. During the year 1906 the following firms have been elected to active membership:

April 13, at the Executive Session held in Chicago—LaFayette Fuel & Builders' Supply Co., LaFayette, Ind.

July 26, Executive Session held in Minneapolis, Minn.—Buckeye Builders' Supply Co., Toledo, O.; W. O. Holst Builders' Supply Co., Toledo, O.; Standard Salt and Cement Co., Duluth, Minn.; S. P. Spates, St. Paul, Minn.; Fowler & Pay, Mankato, Minn.

October 17, Executive Session held in Louisville Ky.—Stone Building Supply So., Greensboro, N. C.; Fischer Lime and Cement Co., Memphis, Tenn.; The M. Van Orden Co., Houghton, Mich.; H. H. Plummer, Menasha, Wis.; The Shakopee Cement and Lime Manufacturing Co., St. Paul, Minn.; St. Paul Lime and Cement Co., St. Paul, Minn.; Capitol City Lime and Cement Co., St. Paul, Minn.; Pana Warehouse Co., St. Paul, Minn.; J. F. Pearce & Son, St. Paul, Minn.; The Mallott Coal and Lime Co., Indianapolis, Ind.; Tower Supply Co., Greenville, S. C.; Samuel J. Vail & Co., Detroit, Mich.; The Lake-Uriksen Co., Jackson, Mich.; J. E. Bartlett Co., Jackson, Mich.; C. M. Clute, Bay City, Mich.; F. P. Young, Bay City, Mich.; A. B. Knowlson, Grand Rapids, Mich.; James Boer, Grand Rapids, Mich.; Wykes-Schroder Co., Grand Rapids, Mich.

February 4, 1907, Executive Session held in Columbus.—V. H. Kriegshaber, Atlanta, Ga.; Wisconsin Pipe and Fuel Co., Eau Claire, Wis.; Ashland Lime, Salt and Cement Co., Ashland, Wis.; The Beloit Lumber Co., Beloit, Wis.; Paine & Nixon Co., Duluth, Minn.; H. H. Halliday, Cairo, Ill.; Greer-Wilkinson Lumber Co., Indianapolis, Ind.; Morgan Coal and Lime Co., Indianapolis, Ind.; Manitowoc Land and Fuel Co., Manitowoc, Wis.; E. C. Segner, Massillon, O.; Waterhouse & Price, San Francisco, Cal.; Peter Fisher, Jr. Co., Kenosha, Wis.; F. R. Smallman, Wauson, O.; J. Rapp & Co., Columbus, O.; The South Side Lumber Co., Columbus, O.; F. B. Holmes & Co., Columbus, O.; Wright Lime and Cement Co., Memphis, Tenn.; F.

P. Jones Co., Wheeling, W. Va.; M. Ganor & Son, Danville, Ill.; R. C. Stader, LaFayette, Ind.; C. L. Dilley & Co., Logansport, Ind.; A. J. Gallion, Logansport, Ind.; A. Albaugh & Son, Kokomo, Ind.; S. Pannabaker & Son, Kokomo, Ind.; Acme Coal and Lime Co., Terre Haute, Ind.; August Fromme, Terre Haute, Ind.; Kirschner Coal and Supply Co., Terre Haute, Ind.; Kennedy-McGinnis-Whitlock Co., Terre Haute, Ind.; The Aldag & Coonse Co., Indianapolis, Ind.; Muncie Builders' Supply Co., Muncie, Ind.; Trentman Supply Co., Ft. Wayne, Ind.; Haines & Good, Marion, Ind.; Frank M. Dell, Indianapolis, Ind.; Peoples Coal and Cement Co., Indianapolis, Ind.; Gill & Greenen, Indianapolis, Ind.; Zanesville Grain and Builders Supply Co., Zanesville, O.; Manchester & Hudson, Providence, R. I.; Jno. A. Dennie's Sons, Memphis, Tenn.; Laird-Norton Yards, Winona, Minn.; Carolina Portland Cement Co., Atlanta, Ga.; Columbus Coal and Lime Co., Columbus, O.; P. Weigerding, Defiance, O.; Ernest Woolenweber, Columbus, O.; Hackman & Kleafoth, Richmond.

At the close of the seventh annual the honorary membership numbered 52. At the Chicago Executive Session, April 13, Mr. A. C. Horn, of New York, was elected to membership, and at the Louisville Session, October 17, the Michigan Sewer Pipe Co., Jackson, Mich., was elected to membership.

At the Executive Session held in this city February 4, the following were elected to honorary membership: The A. & C. Stone and Lime Co.,



HARRY S. WEST, TOLEDO, O.
SECRETARY OF THE ASSOCIATION.

Indianapolis, Ind.; Crescent Supply Co., Marietta, O.; Cleveland Akron Bag Co., Cleveland, O.; Clinton Wire Cloth Co., Clinton, Mass.; Cristy Fire Clay Co., St. Louis, Mo.; Elk Cement and Lime Co., Petoskey, Mich.; Illinois Hydraulic Cement Manufacturing Co., Utica, Ill.; Kosmos Portland Cement Co., Louisville, Ky.; O. D. Levering, Columbus, O.; Laclede Fire Brick Co., St. Louis, Mo.; Northwestern Clay Manufacturing Co., New Windsor, Ill.; Albert Oliver, New York, N. Y.; Peninsular Portland Cement Co., Jackson, Mich.; Rinald Bros., Philadelphia, Pa.; J. M. Wells Co., Ogdensburg, N. Y.; C. K. Williams Co., Easton, Pa.; Youngstown Iron and Steel Roofing Co., Youngstown, O.; Alma Cement Co., Wellston, O.

While we very much dislike to see members withdraw, and especially for what may be considered as only a trivial cause, the above report certainly shows a commendable increase which is another assurance of the stability and good work we are accomplishing in the interest of association work, and, there are many material dealers present at this meeting whom we hope to have as members of the National Association prior to their leaving Columbus, as we believe they will be fully convinced of the necessity of lending us their aid and co-operation, thus assisting in our efforts in their behalf.

It is certainly with a source of considerable pride, you can look back over your work of the past few years and see what has been accomplished.

The past year has been one in which every dealer has enjoyed twelve months of marked prosperity and for which you must not be unmindful of the source of its success. To a great extent it has been due to the "good will" as well as "good fellowship" brought about and today existing between manufacturers, their representatives and the dealer, so realizing what has been accomplished through this medium all dealers should become inspired with the incentive to do everything within their power to further our cause in future.

Entering the threshold of this, our tenth year, let us do so with the avowed determination that "harmony" and "co-operation" will be our watchwords, and, in drawing our conclusions as to what we consider just and proper business ethics, we must not be selfish in our views.

Reflection on the subject will convince you that "our friend," the manufacturer, is entitled to consideration, and, as it seems to be the universal demand that differences, the character of such that we may have, be settled peacefully and through arbitration, to overcome the obstacle "direct competition" with those from whom you buy. As dealers you should at all times stand ready to treat with the manufacturer, especially, if by the course pursued he shows any regard for or a desire to respect, in every way possible, the moral rights of the established dealer. To bring about the state of affairs referred to we have only to continue along the lines we have been working during the past year.

Grievances, we are aware, are bound to arise, however, in many cases we find it is through some misunderstanding. Without doubt there will spring up numerous causes for your entering a complaint, and in this connection I consider it opportune and desire, at this time, to impress upon you the necessity of your secretary having evidence, and that of a nature that can not be, under any circumstances, disputed when placing before a manufacturer a grievance one of you might submit to him. Your Executive Board stand ready and willing, at all times, to lend all aid and assistance possible in case of a controversy, but they have instructed that prior to placing these matters before a manufacturer the secretary must be in possession of evidence as provided for in our by-laws, as the failure of the latter in one or two instances has proved embarrassing.

Too much stress can not be placed on this, and I have every reason to believe, individually, you will appreciate the necessity of the action, as making accusations, to manufacturers, on hearsay evidence, or evidence we can not substantiate, has more of a tendency to cause disruption and ill-feeling than it does to promote the friendly feeling and co-operation we desire to have exist.

A word in regard to the bureau of information, advocated at the last annual. Your committee outlined plans for its operation but these, however, did not seem to meet with the approval of members in general, as the percentage of replies received to inquiries sent out was small, and the information contained therein vague. For this reason as well as others the committee decided to discontinue the scheme for the time being, but will give the subject further consideration at an early date, and they hope some plan may be outlined whereby a bureau of this nature will be operated with success as well as of great benefit to members.

Another matter that I take the liberty of calling your attention to is the Mutual Insurance feature in connection with kindred associations, and especially do I refer to the lumbermen and hardware dealers.

All of these associations, or nearly all, operate, I am told, with decided success, a Mutual Insurance Co. which, from reports saves members many dollars during the course of a year. To secure insurance it is necessary to be a member of the association operating the company, and, no doubt, this feature is an incentive and the cause of their rapid increase in membership. Following is, in part, copy of a letter recently received by the secretary of an association who have in vogue the mutual insurance:

"I think it is of the utmost importance for the retail dealer not only to belong to the association, but to also keep in touch with the work of the organization. The ethical part calls for, and should receive the support of all. Every retail dealer will admit there are some conditions existing now, though fewer than formerly, which he would like to see removed. As an individual he would scarcely undertake the task, but, as a member of the association, at a small expense and small sacrifice

of time, he contributes to the eradication of these odious conditions one by one. Aside from the benefits secured through membership, a saving of more than the annual cost to a member may be made by taking out an insurance policy in the mutual. This and the educational features of our work should appeal to every dealer, no matter how small his investment in a business enterprise may be. I could recite many other reasons why all dealers should belong to our association, however, think I can best cover the ground by saying—there is not one reason against it."

This was one of the many letters, touching on association work, that I recently had the pleasure of reading. Within the past year I have heard several complaints of the high rates charged for insurance, hence, merely make mention of the subject and you can give it further consideration if you deem it advisable.

A word in conclusion. Our association was organized for a purpose, that purpose being, in a great measure, the protection of moral and ethical rights we consider due the retail dealer. Our interest in the work must not cease, but, on the other hand, we should become more active than ever. At these conventions all evince an active spirit, as well as commend the principles advocated, but on your return home you are prone to forget it is not for this occasion only, such spirit should be manifest.

As in your daily business, this work needs care and attention, and, you will greatly aid the officers by offering suggestions, from time to time, which, in your opinion, will have a tendency to eventually eliminate as far as it is possible, "direct competition" with those who supply the commodities to you, as retail building material dealers, handle.

For the many courtesies extended, as well as the hearty co-operation received from officers and members, I take this opportunity of thanking all, and, at the same time, assure you it has greatly aided in my performing the duties of secretary. Gentlemen, I thank you for your kind attention.

The convention also held an executive session Wednesday morning and the next open session was held Wednesday afternoon when the manufacturer and dealer assembled and discussed matters of interest to each.

WEDNESDAY AFTERNOON SESSION.

The meeting was called to order at 3 o'clock.

The President: I had the honor yesterday of responding to the governor of the state of Ohio, and it was indeed a pleasure to stand on the same platform with two such distinguished gentlemen as Governor Harris and Mayor Badger, but I want to say that it did not give me the pleasure that it gives me to address this room full of members before me this afternoon.

I am not a speaker, but we are here to-day to see if we can not make each of us think a little better of each other. Each year I think we find ourselves a little better acquainted than we expected. We first thought in coming to these meetings that our competitors had something to give us, but we find each year much to learn from our competitors. Now with reference to our manufacturers, inasmuch as we are a little closer to the trade than our manufacturer and being unable to speak off-hand, I have prepared an address which I hope you will listen to, after which I hope to have a talk from every gentleman present.

ADDRESS TO MANUFACTURERS AND DEALERS.

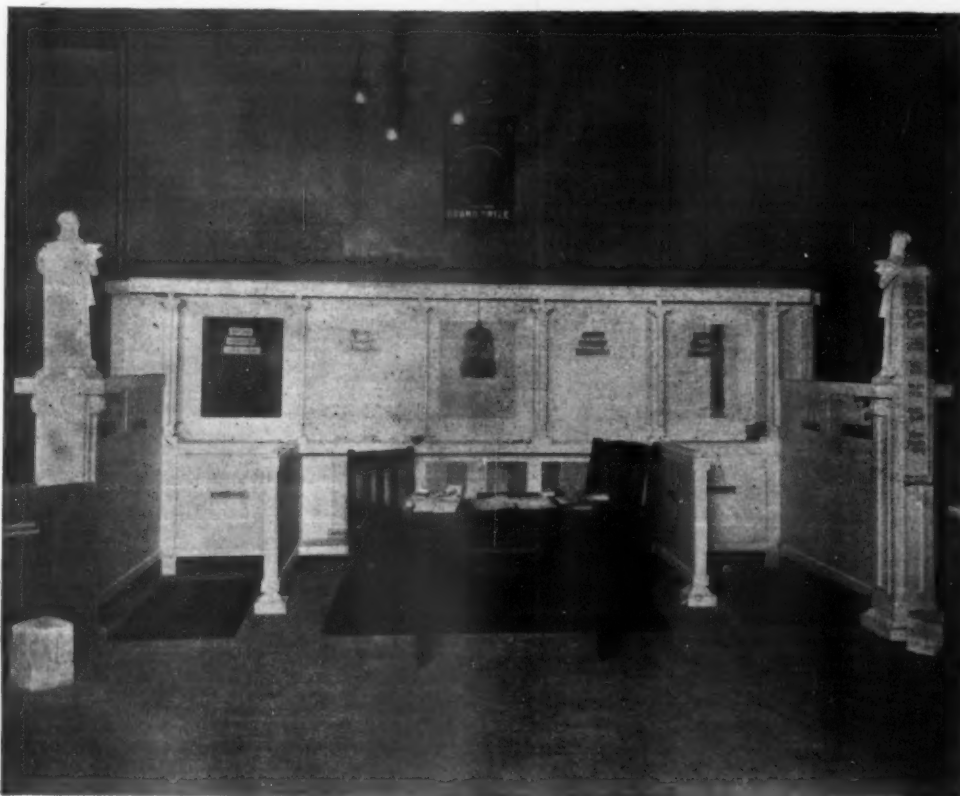
BY PRESIDENT GORDON WILLIS.

Gentlemen: I want to express my great pleasure in seeing so many manufacturers with us to-day. You are not only honorary but honorable members as well and your presence is a compliment to our association. I know that some of you feel that in attending you invite complaints and criticism and at some of our previous meetings we may not always have remembered the duties of host and may have been so discourteous as to find fault; an unpardonable act of inhospitality towards our guests and as such we must consider you.

I will not take up valuable time by boring you with stating the object of our association. You are conversant with our purposes as this subject has been dwelt upon extensively at each of our previous meetings. Suffice it to say that the principal object and most beneficial result, in my opinion, is the closer relation now existing between the manufacturer and the dealer. I am convinced that the manufacturer does not look upon the dealer with as unfriendly eyes as he did in the past. It may be true that some of us have been a little hasty and unjust in our charges and condemnations but I can assure you that it is the earnest desire at all times of the majority, and I will say all the members, to be fair and meet the other side more than half way. And why should we not? It is from you that we obtain the goods, the sale of which gives us our living. We should and must satisfy you to a considerable extent. You have the articles to sell and we must abide by your terms if we want to buy. But does that complete the transaction? The simple sale by a manufacturer to a dealer of a few hundred or many thousands of dollars worth of material at the former's price, terms and conditions does not end the deal. Is it not to the interest of the manufacturer to aid, as far as he can consistently, in getting his goods properly handled by the dealer

If it is a fact that the dealer is the largest customer of the manufacturer then let both recognize that fact and strive for harmony for "in union there is strength."

This leads up to the fact of the wonderful advancement of the United States in every respect but particularly commercially in the last twenty years. Even ten years ago a man would have been thought visionary to have predicted the magnitude of the development of today. But realizing the progress of the last decade, the wonderful improvement in the means and methods of manufacture of all goods and materials, the vast resources we have to draw from, the natural foreign markets, east, west, north and south that are nearer to some parts of our great country than to other competitive nations, is it not reasonable to believe that the future has more in store for us than the past? Will not that which we now look upon as perfect be in a few years obsolete or as much so as the old two horse tandem dray compared to the automobile, or the candle dip of our fathers to the electric light? There is not one of you but what believes that we will at no distant date, travel through the air as we now do on earth and that more wonderful discoveries and inventions will be brought forth. I firmly believe that when this world of ours was created



GRAND EXHIBIT OF THE UNITED STATES GYPSUM CO. AT COLUMBUS—UNIVERSAL FINISH.

and through his assistance have them correctly used by the consumer? Is this result, beneficial to both, going to be accomplished if a feeling of co-operation does not exist between them?

I believe that you manufacturers will acknowledge that by far the larger percentage of your output is sold to the dealer, and yet is it not a fact that many times you will make just as strong an effort to sell one bill of a few hundred dollars to a contractor who may not be in a position to buy again from you for years, as you will to retain the friendship and co-operation of the dealer who will purchase each week probably more than the other would in years? Is it not also a fact that you will expend large sums in various means of advertising for the purpose of convincing and thereby inducing architects and engineers to specify your goods? Does it occur to you that the dealer who handles your goods has a business standing in his community and that he can influence that contractor, architect and engineer better than you can? If he can't do this then you have not the right man and you had better change thereby making and saving money for yourself.

the usefulness of the rivers was not alone that of navigation and irrigation but that the great power of the streams and that of the tides, as well as the currents of the air, will be harnessed by the brains of man and furnish the cheapest and best means of heat, light and power.

Not long since I was talking on this same subject to the president of a large manufacturing concern employing some two thousand men. He said there is not a machine or even any part of it, the life of which they counted as more than five years. He further explained that he did not mean that the machine would be worn out in that time but that before that period had passed some improvement would make the old method too expensive. Does not this same reasoning apply to our lines of business? Are we not in a constant state of evolution and unfolding each day some new way of manufacture of materials or of their use? But let me impress on your minds the fact that in this wonderfully progressive age the humble dealer always will be with you striving in his modest way to keep up with the procession, endeavoring to please those from whom he buys and

those to whom he sells and as is usually the case of the peacemaker or go-between, receiving the kicks of both.

Let me diverge a little by bringing up a subject that is not entirely irrelevant. In our section we are much interested in the project which is now being considered at Washington. I refer to the proposed deepening of the Mississippi so as to permit sea going vessels to go from the Gulf to Chicago. I believe that it will not be many years before this great river and its branches will be walled in from its mouth to the Lakes and its banks on either side will be one continuous dock, with railroads delivering the products of the vast tributary territory to vessels at Memphis, Cairo, St. Louis and hundreds of other points; and that a large percentage of the tonnage that now goes east through the Great Lakes will go direct via Chicago and New Orleans to all foreign countries. A rate from Chicago and St. Louis to Liverpool will be but little, if greater than from New York. I believe that this project is about as necessary to the commercial advancement of the United States as is the Panama Canal, in fact I think that each is essential to and benefited by the other. The topography of the U. S. will be changed greatly when both these great pieces of engineering work are completed. It will change the commercial map of the world beyond the dreams of all. Our exports of manufactures now are less than either Great Britain or Germany. In less than twenty years, maybe less than fifteen, we will export more manufactured goods than both of the nations mentioned.

In closing, gentlemen, I want to say that we believe in that striking saying of the immortal General U. S. Grant, "Let us have Peace." We will strive to do our part and if at any time we do that which we should not, then in that case we ask for the opportunity of explaining and apologizing. If we are wrong, and making amends as best we can. You will always find us working hard for peace and harmony or in better commercial words success and profit. We will be as the writer and philosopher Josh Billings said of the postage stamp. "Its usefulness consists in its ability to stick to one thing until it gets there" and so will we in our efforts to bring us all in to closer communion. Gentlemen, I thank you for your attention and patience.

The President: On the program for tomorrow, we have an address by Charles F. Wade, and we have a letter from Mr. Wade stating that certain conditions have arisen which would prevent his being here. Looking around for some one to take his place, it was suggested we ask Mr. Green, of the Whitehall Portland Cement Co., to give us a little talk. Mr. Green, can we not hear from you?

BENEFIT OF A DEALERS' ASSOCIATION TO THE MANUFACTURER.

BY HOWARD R. GREEN.

Gentlemen: I am very glad to see you, not only the dealers, but also all the other manufacturers. In taking up the question of "The Benefit of a Dealers' Association to the Manufacturer," I think that one of the first things we ought to do is to define what the manufacturer has to do and what the dealer should do if satisfactory business relations are to be maintained. One thing is quite certain, they both have a right to exist.

In the first place the manufacturer has expended a great deal of money in the construction of his plant, and it is the duty of the sales manager of any company to turn in enough money at the end of the year to declare a dividend, and it is also his duty to keep every dealer that handles his goods satisfied as to delivery and in a good humor. It is his duty to see that his goods are kept up to the mark; that his mill is run continuously throughout the year in order to secure the lowest possible cost of production.

With reference to the selling of Portland cement by the manufacturer, he has five different ways of marketing it; that is to say, he either makes a price in the month of January to cover the entire year; or up to September; or July, or April; or he makes a price month to month, and his entire output may be sold by one or all of these ways. This is a question which he must decide.

Now, if a dealer has a price with a manufacturer for delivery up to April, July or September for a certain quantity of cement, and the market advances, certainly the dealer reaps this advantage.

I might say that the dealer who does not contract for the year labors under somewhat of a disadvantage if the market advances and the man who does make a year's contract is working under a decided disadvantage if the market declines. How the dealer should buy is a matter for the dealer to decide and not one for the manufacturer. I think that every manufacturer is always ready to sell his product at a fair price, either for a year's delivery, or on prices quoted each month, but if the sale arrangement is made on the basis of a price month to month, when the first of August comes along and there is an unusual demand for Portland cement, what is the result? The price is then advanced to the dealer. Now if the price is advanced by the manufacturer to the dealer, the dealer should certainly advance his price to the consumer. It would therefore seem that the wise thing to do would be for the dealer to figure approximately as to what he will take or can take within some given period; get his price from the manufacturer for this quantity and this delivery, and then if the price advances 5c or 10c a barrel over his contract price he will certainly receive the benefit of it. It is just here that the dealers' association can be of great benefit to the manufacturer as well as his own individual members.



HOWARD R. GREEN.

When the market price of Portland cement advances, advance your price. Make more money without increased sales and give your neighbor the same chance. Every dealer holds the trade of a certain number of contractors, either on account of financial, social or political reasons, and it ought to make no difference what manufacturer comes into that town he should depend on the dealer for his sales. For the man who has the long time contract to make the biggest profit he must advance when he knows that the manufacturer has advanced.

It is also the duty of the manufacturer to advertise his goods, thus let the dealer and consumer know what he has. If the manufacturer has advertised his goods and the public knows what he has and his product is all that it is claimed to be, then this should be worth something. If, on the other hand, the manufacturer takes no pride in his product and his goods are not advertised, then let his price be made accordingly low. If the manufacturer is willing to assume the responsibility for his material, is willing to help you find a market for it by advertising his particular brand, then he should certainly get a price for it.

There is another thing, gentlemen. When you ask the manufacturer for a price do not neglect to specify the quantity and time of delivery covered by your inquiry. And always bear in mind that when the legitimate market price of Portland cement advances, advance your prices.

The President: I want to extend not only the thanks of the association, but my personal thanks to Mr. Green for his expression of 'the manufacturers' point of view. Mr. Green brought out the question of why we did not advance the price 5c per barrel when our association dealers had the influence to get work. The only answer I can make to that is, that we are "chumps." That's the reason why that advance is not made.

Mr. Cobb then presented a resolution to the effect that it was necessary for the future prosperity of the entire country that the improvement of our various waterways should receive serious and immediate consideration; that to this end, a copy of the resolution would be printed and sent to every member in order that he could use his influence with the Congressman or Senator from his respective district for the furtherance of this project. The resolution was unanimously approved.

The President: We have with us today, a man who is thoroughly capable of giving us an interesting talk on any subject of the trade. The subject he has chosen, however, is "Trade Ethics" and I am sure you will readily recognize the gentlemen, Mr. Charles Weller, of the Wisconsin Lime and Cement Co., Milwaukee, Wis.

(Mr. Weller's address will be found on other pages of this issue.)

Mr. Keller: I would like to know whether this paper of Mr. Weller's will be published and mailed to the members.

The President: Yes, if you have paid your dues. I see another of our cement manufacturers friends in the audience whom I would like to call upon to say a few words, Mr. Charles L. Johnson.

REMARKS OF MR. CHARLES L. JOHNSON.

Gentlemen: I am not prepared for this association talk with you, but I will say what I have always claimed, that the Portland cement manufacturer should sell his entire product to the dealer, and to the dealer alone, without soliciting the contractor's trade. During the time I have been with the Castalia Portland Cement Co., since 1898, over eight years, we have sold our entire output to the dealer and the only loss we ever made during that time was less than \$200.00—that was in the matter of a dispute of a duck bag account, so you will see we made no loss whatever.

Yesterday, I had the pleasure of addressing the Retail Lumber Dealers' Convention at Detroit on the "Marketing of Portland Cement," and at that meeting I stated as I do here, that I have stood alone in the Western Association of Cement Manufacturers and fought the battles of the dealers single handed, and am on record as acknowledging that I was proud that I would sell our products to the dealer and not the contractor.

Now, the manufacturers are paying more attention to the dealer. Of course in Michigan where the financial losses in the promotion and erection of some of the plants have been tremendous, there may be some deviation from this rule. In the East, however, the largest manufacturers of Portland cement are selling exclusively to the dealers, with the exception of contracts with the government or railroad companies, or large contractors doing work in certain parts of the country that would interfere with the dealer. Conditions have rapidly changed in the last three years, and no matter how large the output, I can not see why the manufacturer can not sell his entire product through the dealer and to advantage.

The great trouble has been that the salesman who is sent out is told by his sales manager, or secretary that he has a certain amount of cement which must be sold, and that if he can not sell to the dealer, to sell to the contractor, in order to get money in for their payrolls or dividends, but I say, that if you get to a town and can not sell the dealer, go to the next and so on until you have made your sale and made it to a dealer.

The President: I want to add a little further to that. The associate members come to our meetings principally to associate with the dealers in the lobby. We want them to come into the meetings and tell the plain truth to all of us; not associate in the lobby, but associate in the meetings. If we are wrong in the handling of their goods, let them tell us; we are here for education. Mr. Johnson has always acted in a manly way toward all of us and I thank him for his kind words.

If there is anything further to be said I should like to have any member express his views, if not, we will adjourn.

(Report of meeting continued on page 54.)

ILLINOIS SUPPLY MEN MEET.

First Annual Convention of Young Association is Held at Chicago—Interesting Sessions.

MEMBERSHIP NEARLY 250.

The first annual meeting of the Illinois Masons' Supply Association was held in conjunction with the seventeenth annual meeting of the Illinois Lumber Dealers' Association in Chicago at the Lexington Hotel February 14. The progress that this association has made since its birth is remarkable. The membership is close to the two hundred and fifty mark and there is every indication that within a few years it will be as strong as the Lumber Association. In the year the association has been in existence it has accomplished much good. It has established an office in Chicago and has in charge a secretary whose entire time is given to its affairs.

MORNING SESSION.

President Willis Harwood called the meeting to order and requested Secretary Hogle to read the minutes of the previous meeting which were approved. The president then read his annual address which was as follows:

ADDRESS OF PRESIDENT HARWOOD.

The Illinois Masons' Supply Association was organized at Decatur, Ill., January 15, 1906. A dozen or more men prominently identified with the building trades throughout the state were present at that meeting, which was held pursuant to a call issued by G. J. Parke, of Decatur, who was active in forming this association and who at this meeting was elected its secretary, serving in this capacity for several months, when the pressure of his private business compelled him to resign. E. W. Hogle was elected in his stead and the offices of the association established in Chicago, where its affairs could be handled more advantageously.

The growth of the association has been very satisfactory, but there are hundreds of dealers over the state who, knowing the benefits to be derived through affiliation with us, would quickly join our ranks. We have been somewhat handicapped the last year by the lack of money properly to carry on the work. A few of the directors advanced funds to tide us over and we hope the revenues will be increased sufficiently, in the near future, to repay them.

Nothing I might say would add materially to the meaning and intent of our declaration of purpose, which is concise, yet broad in its scope. What are we striving for at the present time is a representative membership, that we may be better prepared to meet the coming issues between the manufacturers and the dealers. An organization of strength is a power that will prove a prominent factor in the adjustment of differences which are likely to arise.

We will appreciate expressions from the members present as to the benefits, if any, they have received by being identified with this organization. My observation which has been almost wholly confined to my immediate territory, is that the manufacturers are inclined to recognize us, though in the main they were originally hostile to our cause. While there have been some encroachments on our trade, we are in a position to say that without the check and wide influence of this association much more trouble would have resulted. We can not weigh to an ounce the measure of value an organization of this character in the broad field of commerce, but similar bodies have demonstrated beyond all doubt that they are governors to the erratic pulse of heated competition and have also been the vehicles of bringing together in peace conferences the wholesaler who judiciously would market his goods through legitimate channels and who occasionally violates trade ethics, and the retailer who asks and demands protection of the business he has created by individual effort and financial risk.

I will not fire you with figures. They will appear later. You will note on the program addresses to be given during this session, which no doubt will be of great interest. The speakers who have so kindly consented to give us the benefit of their knowledge are men of experience in the lines of industry they represent, and I respectfully ask that you favor them with your presence and close attention and that the facts as given from their points of view may impress you favorably and be instrumental in bringing the manufacturers and dealers into closer business relationship and social intercourse.

In this connection I would like to suggest to the members the idea of developing more and more the social features of our conventions, eliminating to a degree the trade solicitations that often predominate and are annoying to many. The majority of us come here to get away from the daily grind of routine business, seeking recreation in the exchange of ideas, in closer acquaintance with our fellow dealers, coming into contact with the men who supply us with the commodities we handle and on the common ground of good fellowship, establishing the friendly relations so essential to the maintenance of organization and the promotion of association work.

Permit me emphatically to urge co-operation of the manufacturers and dealers through the medium of this association, the future of which depends upon your support. Personal solicitation by the members and diligent and persistent work by the officers will accomplish our purpose and place us on a plane with our sister association, which is defending our cause so ably. The fee is nominal and should not be a barrier to any one eligible to membership.

You are all familiar with the history of the lumbermen's association, which started under much more unfavorable conditions than existed at the time we organized; yet it survived and is a living example of what has been done and what can be done, through associations founded upon correct principles.

In retiring as the first president of the association I wish to thank the members of the executive committee who have sacrificed their time and money to promote the welfare of this body, and to the secretary for his untiring work. I regret my inability to have given the association more of my time and attention. I bespeak for my successor the active and financial support of increased membership and feel assured that the association will prosper and gain in strength and efficiency.

After the reading of the president's address the secretary read his report which was as follows:

SECRETARY'S REPORT.

Former Secretary Parke had charge of the affairs of the association until the early part of June, at which time business care so absorbed his attention that he was unable to give the work of the association the attention that was due it and so felt himself forced to resign as secretary.

The incumbent was then chosen by your board of directors and the offices of the association were moved to Chicago.

In taking up the duties of secretary I felt a little unrest at first. The association was in its infancy, there was little money in the treasury with which to carry on the work and it does take money to spread association gospel, but I had reckoned without taking into consideration the caliber of the men on the executive committee. A group of men more loyal to your interests could not be found than the members of this committee. Their purse strings were unloosened and their time was at the disposal of the secretary whenever he needed their aid. They realized that concerted action on the part of the retailers of masons' supplies was necessary to check the encroachments of the wholesalers that have been going on unchecked since the inception of the industry. When the funds of the association were depleted they made substantial loans to the treasury that have tided us over the dull season, when there has been little if any movement of cement and new members have been extremely hard to obtain. The dues to the association are very nominal being only \$5.00 the year and it seems to me to be the duty of every dealer in this state to affiliate with us thereby protecting himself and lending his influence toward protecting others. The strength and resultant influence of associations of this kind lie in the size of their membership and the more

members we get the more the wholesaler will stop and think before making direct shipments into territory covered by this association.

Along this line let me say just a word. The wholesalers are keeping a close tab on the progress of this association. If perchance the secretary overlooks a wholesaler in sending out the regular membership list it is not so very long before he gets a request for a copy from that wholesaler, for they want to know what new territory we have closed up, as they consider points where we have no member as open territory.

The primary object of this association is to disseminate information as to what wholesalers respect the rights of the established local dealer and which do not, but ship direct to Tom, Dick and Harry. This information should be of value to every retailer, for you do not wish to patronize a concern that will ship into your fellow dealer's territory. For if they do it to him they will to you. Now to get this information—to get all of it we must have a member in each locality. At present we have the central part of the state fairly well organized, but the edges are still open and to the dealers who are present who live near the boundaries of the state and are not already affiliated with us I want to make a special appeal to become one of us, and reap the benefits that are sure to come from our concerted efforts.

These results may be slow in showing themselves, as it is impossible to rectify in a few months abuses that have existed for a decade. We have to work in a wedge here and a wedge there and by persistent effort and concerted action gain our ends.

As an association the Illinois Masons' Supply Association has been extremely successful in the first year of its existence. Its membership numbers over 225 dealers, a mark that it took the lumber association over three years to reach, and it has done more in this short time in systematizing trade conditions and has gained more prestige with the wholesaler than the lumber association did in the first five years of its existence.

As the yield of the forest is diminishing year by year there has been a demand created for a building material that will take the place of lumber. Cement and plaster have come to supply this demand. Shall we attempt to let an industry that is rapidly growing to such enormous proportions run along without some permanent organization to look after the rights of those who devote their time and money to this business, setting up an office and warehouses and other facilities for the proper handling of building material and keeping on hand a stock adequate to the demands of their community? I say no, gentlemen, and now is the time to give the association your loyal support. If you are not a member, become one and if you are a member get your neighbor who is not a member to join and then pay your own dues. A large number have been holding off from paying their dues until they came up to the convention and I just want to remind you that the young lady to the right as you go out of the hall is there for the purpose of receiving for dues and to take new applications.

We have endeavored to make this first annual meeting as enjoyable as possible. We have some interesting speeches to listen to, which will be both instructive and enjoyable. A time also has been set aside for an open discussion of questions that anyone desires to raise and as these will probably relate to the wholesaler more or less I hope that the wholesalers or their representatives who are present will enter into this discussion and give us their views on the questions raised. In the last six months I have attended half a dozen local meetings, at which some vital points have been raised and satisfactory solutions arrived at. These local associations are doing a world of good in promoting harmony in the trade. They are the wheels within the larger wheel, and form an important factor in the balancing of our machinery. I wish to mention especially the organization in the southern part of the state—the Southern Illinois Lumber Dealers' Association. I attended its meeting, which occupied two days of last month, in which there was not a dull moment. Papers were read by the members that struck right home to the heart of every man present. They were filled with wit and anything that savored of the prosy was eliminated entirely from the meeting and every one left with a feeling that the time put in there had been spent to good advantage.

Not to take any more of your time, gentlemen, I wish to welcome you all to our meetings and

hoping that we may have as successful a year in 1907 as we had in 1906, I thank you for your attention.

The secretary then read the financial report of the association and it was referred to the auditing committee.

The next on the program was the paper on "What Can the Association do for the Dealer," by E. H. Defebaugh, editor of ROCK PRODUCTS, which in his absence was read by Fred K. Irvine. The address was as follows:

WHAT CAN THE ASSOCIATION DO FOR THE DEALER?

BY E. H. DEFEBAUGH.

Mr. President and Gentlemen: Owing to a very severe cold I find it impossible to be with you, to renew pleasant acquaintances and bid you God-speed for a successful new year with your association. However, I am with you in spirit and this suggests to me the conversation of three small boys who sat on the back fence trying to see which could tell the biggest story.

The first one remarked, "Say, Cullie, my dad is going to build a house and he is going to put a steeple on it."

Small boy Number 2 said, "Huh, that is nothing. My pa is going to put a flag pole on our new house."

Number 3, not to be outdone, said, "My father is going to build a new house and he is going to put a mortgage on it."

Now, a mortgage doesn't appeal to us if it is in the hands of a Shylock, but it is my belief that if this association can establish its influence so as to surround the dealers in the state of Illinois such a mortgage would assist every dealer within the state in such a way as to insure his profits and assure his personal co-operation in this organization. And that will mean that reciprocity will prevail throughout the great Prairie State, and instead of ill feeling between manufacturer and dealer and small profits to both, because the manufacturer drops in and takes the biggest order at a low price, there will be good feeling on both sides and the manufacturer will secure a greater business in the state, because the dealer can afford to go out and nurse the consumer and get him to use cement or lime or plaster liberally where heretofore he has used as little as possible. The dealer will secure more money out of his investment and carry a larger stock of building materials in his yards. The mortgage will not hurt him because it is in the hands of his partners who are all members of the Illinois Masons' Supply Association.

I remember back fifteen or eighteen years ago when the lumber associations were first started throughout the West; that is, I mean, when they got going in earnest, employing men to give their best thought and energy to promote the interests of the dealer. What a change that policy made. The poacher in the days preceding this period made life miserable for the dealer and he had no redress, and poachers were plentiful, too.

You all, perhaps, remember the first case of importance, whereby the Northwestern Lumbermen's Association made life a burden to the Bohn Manufacturing Co. because they had been stepping on the toes of the dealer, and since then there has been very little necessity to use harsh methods.

You have been benefited in your Lumbermen's Association. Why not in your Masons' Supply Association? It is more important today that you uphold this association and make it strong and make it a wheel within the great wheel of the national organization than ever before, because as the years go by more masons' supplies are used for we are entering the Stone Age, due to scarcity and high prices of lumber and, in some cases, inferiority of that material. The cement, lime and plaster industries have accumulated great interests, as the increased sales of cement alone plainly show.

The protection of the dealer in his home town is a fair and considerate way for the manufacturer to foster his own business, but the dealer needs to be broad-gauged too when he requests the manufacturer to stay out of a certain city, and he should endeavor to see that such manufacturer gets a fair share of his business, or that some other dealer takes his material, for such products as cement, lime and plaster are not manufactured to pile up in the warehouse to keep and, therefore, if it is possible for the managers of the various dealers' associations to co-operate with the managers of the manufacturers' associations so that

reciprocity and absolutely fair play is carried out it will make the dealers' road pleasanter and the manufacturers' likewise. Such things can only be brought about through organization and that is why we believe in a figurative mortgage on every dealer, in order to secure his co-operation. His moral and financial support of this association, will make your positions stronger, will make it possible to be fairer with the manufacturer, and the consumer will pay the bill.

While in attendance at the National Supply Dealers' Association at Columbus, Ohio, the other day I was particularly struck with the fact that the days for post mortems are over. The manufacturers were not inclined to bring up old sores, and the dealers had apparently forgotten that each had done something that might not be considered strictly under the rules of Hoyle. It was a case of the lion and the lamb sleeping in the same bed. It is always easier in good times like these to maintain reciprocity between the dealer and manufacturer because each has all he can do, and with anything like business acumen they are all making money, but when the crow squawks and business is dull and the manufacturer has to wear out his shoe leather walking back and forth between the office and the bank in order to carry on his plant, his sales manager is generally urged to sell stuff. He is not inclined to be so particular about the dealer and his place in life, and that is why this organization should be made more effective and its membership increased until it will be a power in this line and will absolutely insure the integrity of the business in the state of Illinois, as well to prevent dealers from doing unscrupulous things with the manufacturers, and causing the manufacturers to protect the dealer, so that when he finds it necessary to take business in a certain territory because it happens to be a large railroad which will not pay a percentage to a local dealer, and will not buy locally, the said manufacturer is only too glad to make the price in such a way that the dealer will get a percentage. And where it is a case of a large order the dealer should not be too greedy. It is not just that on an order of \$400,000.00 or \$500,000.00 that the manufacturer should pay as large a percentage as on a single carload, and the price, when it is grovelling down towards the cost point, will not admit of it. Through this organization if there were a thorough understanding and the membership large enough to intelligently adopt plans and fairly legislate in this body, reciprocity could be carried out to the letter with benefit to all, and both the manufacturer and dealer would then figure up larger dividends.

If you don't believe this take your own experience with the Illinois Retail Lumber Dealers' Association or that of your neighbor in the Northwestern Retail Lumber Dealers' Association and then look at the other side of the problem.

What is \$5.00 or \$10.00 a year for such a protection of your trade? You could get one hundred times that much out of the investment, and yet dealers are slow to do their part. Is it always necessary to make a diagram for some of the dealers to see where they get off. What you need is the membership application of every dealer in the state of Illinois, and a full attendance at these meetings. A hearty co-operative banding together of the dealers will insure the ideal condition of complete reciprocity of all the community of interests represented by the masons' supply industry of the country. The co-operation of this organization should become a powerful part of the National body of dealers who are working to the same ends, so that the circle of unity among men engaged in the same interest may protect one another everywhere.

We greet you, one and all, upon this important occasion, and pledge you the hearty support of ROCK PRODUCTS in all your endeavors. Not only to the officers in their capacity as such, but each and every dealer is invited to use the paper that is directed to your interests and dedicated to the cause.

We will toil for your success and the editor and every member of the staff will be found to be an enthusiastic association worker. I thank you for your patience.

The address brought forth much applause and the speaker was followed by S. W. Curtis, of the Garden City Sand Co., who spoke extemporaneously on "The Practical Making of Portland Cement Blocks." Mr. Curtis said that inasmuch as the dealers in building materials handled all products necessary for the manufacture of cement

and concrete blocks with a small investment a machine for their manufacture could be purchased and blocks made and either sold or contracts taken for work. While it was not advisable to undertake too much of this work, basement or foundation work could be undertaken in fact all work on a house up to the gables without difficulty. For foundations a plain faced block is the best as the cost is much less. The same machine which may have as many molds as is desired can be used for making rock face blocks to be used above the ground. In the mortar, he said, it is necessary to make a tight solid joint as this is where the concrete block wall fails to make good.

The mixture to be used was carefully described. The cement should be mixed with the sand dry, then the water should be added. Several proportions using different grades of sand were fully discussed.

Mr. Curtis thought that on a block made by a face down machine the surface could be floated. This not only gives a smoother but lighter colored face. He also laid great stress on the blocks used for water tables, window caps or bases in which he stated that a solid block should always be used in place of a hollow block for this work. He thought it advisable in curing blocks to let them stand for six or seven days in order that they may thoroughly season.

Another thing he pointed out was in setting blocks in a wall never use one that is cracked. This led to remarks on waterproofing on which he spoke for some time.

Mr. Curtis' talk was both interesting and instructive and many questions were asked him about the manufacture of blocks, all of which he intelligently answered.

Mr. C. H. Rose, also of the Garden City Sand Co., was then called upon for his paper which was entitled "Plaster."

PLASTER.

BY C. H. ROSE.

Plaster—its use and abuse. What can be done to increase its use and stop its abuse?

All are familiar with the use of hard plaster. The largest use is for plastering walls, ceilings, columns, bases, wainscoting, setting tile, etc. Hard plaster has come to stay, and if any of the dealers present are not of that opinion I want to start in with them and try and convert them so they will pay more attention to it and sell more of it and do it easier than they have done. But if you do not have the faith in it, you will not meet with as good luck, and if you stop to think, you will find you are selling more of whatever you are inclined to push, no matter what it is.

The moment you forget to talk plaster and let your customer have his own way on the account of cost, he will use lime, while on that same building you have influenced him to use several things he did not intend to. Why? Because you have convinced him that it was better if it did cost some more. You can do the same with plaster if you only think so, for it is so much better, and if you will make special effort you will succeed nearly every time. So it is largely up to you to talk up the use of hard plaster for the world is moving ahead, not backwards. It is better and in keeping with the times.

The plasterer who has not made up his mind to use hard plaster should be helped to try and elevate his trade, as he now usually gets the worst of it and they spend money for all kinds of things in a building and skin him down to where he can not do a good job with anything, and you must try and help him make more money, to get price enough so he can do a good job with hard plaster.

Troubles and Disagreements.

You all have more or less trouble about the plaster business, and invariably it is due to mixing too much sand with whatever compound you are selling, for sand is cheaper than the plaster. Sell the prepared or sanded goods wherever you can and do not let them have any sand around the building and you will find there is less trouble and complaint and the owner will get a better job, though sometimes this fails and the plasterer says the material is not right, and sometimes it is not. But generally the fault lies in some other cause, and why is it any worse to have some of these troubles with hard plaster than with lime? There are several reasons. Nothing is expected of lime and it can do almost anything and no one will complain, but the moment anything is wrong on a hard plaster job there is a hue and cry about it so as to scare others out of using it.

Ceilings have been known to fall and do more or less damage that has been done with lime and also

with hard plaster when abused and not used according to direction. The causes usually of poor work with hard plaster are bad lathing, or kiln dried or exceedingly dry laths, climatic conditions, and on hot, dry days, slow or extremely slow setting plaster, so it dries out before it sets, giving the wall and ceilings a white appearance, soft and dusty. Such walls should be wet thoroughly before finishing.

Retarders.

I would like to dwell at some little length on this subject as I think it is very important, but I do not have the time, and simply will say in passing that I believe there is room for great improvement, as seemingly all of the retarders now in general use do affect the plaster very materially, when used in too large quantities, causing it to be weak and poor and not of sufficient tensile strength or hardness to in many cases stay on the walls. I think that the general tendency is to use too much, giving the plasterers too much time to do their work and that precaution should be taken in this direction. From the many tests that I have made I firmly believe that until the retarder can be of a more perfect nature than at present, it ought not to be used in quantities large enough to prolong the setting over two hours, for everything longer than that weakens the plaster very much. It is true, we have calls for plaster to set very slowly, sometimes three and four hours for special uses, but these are of such a nature that the mortar can be of much less strength. Again, we have orders for plaster for patching and repair work to set in from 15, to 30 to 40 minutes which in most cases we try to manufacture as nearly as possible. I have noticed that plaster which sets in 30 to 40 minutes breaks at a much higher tensile strength than the plaster that sets in from three to four hours.

Manufacturers of Plaster.

Do you think that plaster is made as good and uniform as it can be? No, I don't think you do, and it will not be until you get after the manufacturing companies and insist on it being more perfect than it is now. What has been done on Portland cement in the way of cheap manufacture and good uniform grade can be done on plaster when you insist on it. We are all in the "go as you please" race, now on the plaster with no fixed rules or specifications as to quality, either tensile strength, hardness, fineness, setting time or anything else. Ask for some regulation on plaster as well as Portland cement. Why not ask the American Society of Civil Engineers to draft specifications that will fit the requirements of hard plaster.

Is it not time that an industry as important as hard plaster of this country should have something of this kind so that architects and engineers would have something to tie to, the same as they now have with the Portland cement manufacturers?

The American Society of Civil Engineers and Testing Materials have got out regular specifications which every manufacturer knows must be complied with or he can not sell his cement. Why should not the manufacturer of plaster be obliged to conform to the specifications adopted to his material to do the work intended for it just as well as cement, steel, stone, brick, etc? You can insist on this and as soon as you do, there will be something done about it. Why not appoint a committee now to do something of this kind and have something to go by in the near future? It is the only solution of the proposition that the manufacturer of plaster has in order to make a more uniform and perfect plaster. And it is as much to the interest of the manufacturer as to the dealer for then the faults can be traced to where they belong, the same as now is the case with Portland cement.

The Royal Testing Station of Germany tests everything. Why not have one in this country? You can if you want one, and why not take action at once, and interest all of our folks at Washington to start it going and introduce a bill to that effect. Are we not as good as Germany and is it not time we had a testing station to test all kinds of building material?

Mr. Rose's paper brought forth much discussion principally on the relative values of the qualities of both bank and river sand found in the different localities and rivers. Mr. Rose was questioned considerably by different ones and his answers showed that his study and knowledge of sand made him an expert on the subject. Mr. Curtis also gave some very interesting information on white sand and its use in sidewalk construction work, in which he stated that white sand had been found satisfactory for this work. Mr. Lewis, Mr.

Halliday and Mr. Paddock, each of whom is a large operator in sand, spoke on this subject.

The president then read the names of the committees he has appointed, which were as follows:

Nominating—Messrs. Rourke and Stotler.

Auditing—Messrs. Paddock and U. H. Hunter. Constitution—Messrs. Glone, McFeeley and E. F. Hunter.

Resolutions—Messrs. Holcomb and Birmingham.

The meeting then adjourned.

AFTERNOON SESSION.

The president called the meeting to order promptly at 2 o'clock and called on Charles L. Johnson, of the Castalia Portland Cement Co., for his paper on "The Manufacture and Marketing of Portland Cement."

MANUFACTURING AND MARKETING OF PORTLAND CEMENT.

BY C. L. JOHNSON.

I am indeed very glad to be with you and to have the honor of addressing you on the subject assigned the speaker by your committee. We have gathered here in joint conference to seek all the knowledge and benefit we possibly can on subjects which are of vital interest to all of us. There are among you here a large number of act-



C. L. JOHNSON.

ual consumers of cement and an equally large number of dealers in cement, lime, plaster, lumber, etc. The manufacturing and marketing of Portland cement is indeed a very broad topic to fully explain by one speaker or in any one paper, therefore I will have to condense my remarks.

History chronicles vaguely the events of a period known as the "Stone Age," when men wrought with the crudest of implements and eked out the merest sort of existence. But man's necessity made him progressive and his cunning taught him to devise better instruments of bronze with which to serve his purpose, only to find them in turn inferior to the improved work of his son in the Iron Age.

Each plays its part in the economies of Nature, then yields place to its betters. And the Stone Age, the Bronze Age, the Iron Age retire, yielding the palm to the Imperial Age of Cement.

No product in the world has a wider application to useful purposes than Portland cement. Men who know its worth realize that it is the only absolutely fire-proof building material in the world. In this respect brick, terra cotta, iron and granite all suffer markedly by comparison with it.

It is the ideal building material in bridge construction, whether for strength, form, beauty, or durability. There has never been found a pav-

ing material on earth equal to Portland cement concrete, whether for sidewalks, streets, or roadways. In house building there is hardly an article used that can not be made stronger and more durable out of Portland cement than out of any other known material.

Recently there has been so marvelous a growth in the manufacture of Portland cement, and its uses in great works of construction have multiplied so rapidly, that a little digest of information about it will doubtless prove acceptable here.

Egypt was probably the home of the early cement makers, 4,000 years ago. But their art perished and history records nothing important either in the manufacture or use of cement for fully 2,000 years. The Romans then discovered a process for manufacturing a hydraulic cement, the result was the so-called Roman cement, intermediate between Portland and natural cement of today, and for which they found very extensive use in the building of walls, vaults, roadbeds and the like. But they, like the Egyptians were the sole possessors of the art, and seemed to have found no imitators up to the time of Col. John Smeaton, in 1756.

Smeaton was a celebrated English engineer who discovered that a certain limestone containing a percentage of clay produced on being calcined a cement which he termed "Improved Hydraulic Lime." Zealous in his purpose, Smeaton risked his reputation as an engineer and showed his faith in his material by building with it the famous Eddystone Lighthouse, the foundations of which stand today as a monument not only to the excellence of his cement, but to his ability and courage as an engineer. The work was completed in 1759, and has withstood the fiercest storms for a century and a half unharmed, and to the present time. It was with this discovery that the real history of modern cement manufacturing commenced.

A third of a century later Mr. Parker, of London, patented a process for manufacturing Roman cement that produced a product about the grade of the present American natural cement. Several other patents were taken out previous to 1813, when a French professor at Paris discovered the fundamental chemical action in the manufacture of Portland cement, namely, that in the burning the silica of the clay unites with the lime and produces a product with hydraulic properties.

Following this line of investigation, Joseph Aspdin, an Englishman, manufactured in 1824 a cement which he called Portland cement, since the blocks molded from it so closely resembled building stone of that name quarried at Portland on the Cornish coast. For 25 years the new material was put to frequent tests, and the unqualified indorsement it received forced its recognition by English engineers, who finally accepted it as a reliable building material.

In 1846 the first cement mill was established in France near Boulogne, and in 1855 the first in Germany, at Stettin. About the same time Belgium, Austria and Russia also took up the manufacture of Portland cement. England, the first in the field, maintained the lead for twenty-five years, but the continental factories being under more progressive management soon forged ahead, and the German product became the standard for the world.

In 1872 David Saylor built the first American cement factory in the Lehigh Valley Pennsylvania, and its product soon became a worthy competitor of foreign cements, demanding for itself recognition just as its English predecessor had done. Mr. Saylor, who was a man of energy and ability, made up his mind in the early seventies that he could make Portland cement in this country, and his first experiments were most interesting. By sheer force of his native ability, Mr. Saylor studied out the problem and was successful. Mr. Saylor's work was materially aided by Mr. John W. Eckert, a graduate of the Lehigh University, who became first the chemist and afterward the superintendent of the Coplay Cement Co.

While this experiment was being carried on to success in the Lehigh region, and the foundation being laid for a large industry that now exists, a small plant was erected near Kalamazoo, Mich., in 1872. Owing to the scarcity of the material and high cost of labor and fuel, these works made cement which was too expensive commercially, and did not succeed.

In 1876 works were started at Wampum, Pa., near Pittsburg, using limestone and shale. This plant is still in existence and has been a success.

At South Bend, Ind., Thomas Millen, an Englishman, found a white marl and a blue clay, which resembled in composition the materials used for cement making in England; he started a small

works there in 1877, but has since abandoned it and transferred his field of operations to Wayland, N. Y.

In 1885 a plant was built by the American Cement Co., at Egypt, Lehigh County, Pa. This was followed the year after by the Atlas Portland Cement Co. From the three mills, all located in this district in 1886, the industry has grown so that today there are 35 mills. A plant was erected at Bellefontaine, O. in about 1890; this plant still exists.

In 1893 a plant was established near Sandusky, O., and afterwards various other plants were established at Castalia, O., West Middle Branch, Ironcon, Wellston and Rushsylvania. In Michigan the cement industry has rapidly developed and today there are 14 mills in active operation and in Indiana four plants, and Illinois four plants; while west of the Mississippi there are quite a number of plants located in Missouri, Kansas, South Dakota, Colorado, Utah and California, and in the South plants are located in Texas, Georgia, Tennessee, Virginia, West Virginia, Arkansas, Alabama and Kentucky.

There are nearly 100 plants in operation in this country, many of them meeting with great success, others with financial reverses. Management tells the story in the manufacturing of cement the same as it does in other lines of business. The output for 1906 was forty million barrels. This would mean a per capita production of one-half barrel of cement for every man, woman and child in the United States. The total capitalization of all the American Portland Cement Companies now in operation is somewhere between one hundred and ten to one hundred and twenty-five million. This of course takes no account whatever of outstanding bond issues, and on the other hand gives no credit for stock authorized but not issued.

The chemical elements necessary for the manufacture of Portland cement are lime, silica and alumina, the last two being generally supplied by some form of clay or shale. The average ratio being one part of clay to four parts of carbonate of lime. In the United States the lime used in the manufacture of Portland cement is found in several forms, which may be classified under three general groups, argillaceous limestone, marl and limestone, the latter group being capable of considerable sub-division.

If the raw material consists of limestone rock and shale, they are mined from cliffs adjoining the mill, and after being weighed and mixed to the proper proportions, are delivered to the crusher; from the crusher the material goes through dryers, which take away all moisture, and from the dryer to the raw mills, where it is pulverized; then it is delivered to the kilns. In these kilns the chemical combination takes place at a temperature of 3,000 degrees. The raw mixtures become white hot clinker, which has the appearance, when cool, of ordinary cinders. Clinker is cooled either in towers or in ordinary rotary coolers, the cool clinker is conveyed to the finishing mills, where it is pulverized and sent to the stock house as finished cement.

After sufficient time has elapsed for cooling, the cement is conveyed from the stock house to the packing department. If you were manufacturing cement from marl and clay, your marl and clay would be carefully weighed and mixed and agitated in large tanks and is then given a reading by the chemist. If it is not correct, more marl or more clay is added and then re-agitated. From these slurry tanks the mixture is conveyed to rotary kilns which are anywhere from 60 to 135 feet long, and there calcined at 3,000 degrees of heat and the clinker is immediately conveyed to the coolers; from the coolers to the dry grinding department, where it is pulverized down to 92 or 95 per cent fine through 100 mesh sieve.

Rock and shale cement is also ground to the same fineness, both processes of manufacture have practically the same burning and grinding apparatus. After the cement is thoroughly seasoned it is then ready for shipping, so you see it depends largely upon the nature of your material as to the process of manufacture.

Every plant in the United States endeavors to the best of its ability to secure competent chemists and good superintendents and it is the intention of the manufacturer at all stages of the process to give the consumer the very best material he possibly can, and the great results in the engineering world have gone to show that Portland cement of today is far superior to that of 10 or 12 years ago; in fact it is much better than anything ever manufactured in Germany or England. America leads the world today in cement, same as it does in everything else.

After the manufacturer has his cement ready to sell, he must naturally secure some one to sell it. He selects either a large wholesale building supply concern to market his goods, throughout the territory they operate in, or he secures the services of a salesman, who generally has his assistant or assistants, depending upon the amount of cement to be sold.

After the manufacturer has decided upon the machinery or marketing his cement, some one then has got to be found who wants to buy cement, therefore it depends entirely on the gift of salesmanship to market the production. As stated before, last year forty million barrels of Portland cement were manufactured and sold in this country and if indications are right the sales will be fifty million in 1907, an increase of 20 per cent over 1906. Where does it all go, you ask. Look at the wonderful construction work going on in the engineering world. Look at the thousands of miles of sidewalks constructed. Look at the skyscrapers being erected in our great cities. You can then imagine the magnitude of cement industry.

I am willing to predict that the demand for Portland cement for 1907 will be so great that it will be totally impossible for the cement manufacturers to supply the demand. The enormous increase in the manufacture of concrete building blocks is such that for 1907 it will be at least double over that of 1906. Manufacturers of cement block machinery inform me that they are crowded with orders for months to come, although they have increased their facilities more than double their actual capacity of 1906. You must remember that this demand for cement is not in any one special section or sections of the country. It is all over the United States and lower Canada and Mexico, saying nothing of the immense construction work going on in the Panama canal and throughout South America.

American Portland cement is being shipped to every well known country in the world. You will be surprised at this statement, but there is one manufacturer of Portland cement in this country that has shipped his cement into every country on the map, and I know this to be a fact.

I am now going to touch on a delicate subject, for as I have stated before, we have here today both consumers and dealers as well as manufacturers of Portland cement; they have all their rights and privileges, of that there is no question. A contractor has to live and he must buy as advantageously as he possibly can. A dealer is a necessity in his community, and must also exist, same as the contractor. They are both operating in separate lines and still at the same time should be working together. How many times have I received letters from contractors, cursing the local dealer in his town, and how many times have I received communications from dealers urging me to disregard the complaints of this and that contractor and to stick to the dealer. The man who has to sell the product of a mill must have stamina and backbone and realize the rights and privileges of the contractors and dealers and also realize the great principles involved in the Northwestern Lumbermen's Association and the National Builders Supply Association, and the various lumbermen's and builders' supply associations all over this country. To be a legitimate dealer, you must maintain and operate your own warehouse. You either rent or lease or own the building you occupy, and make your living by selling cement, lime, lumber, sewer pipe and other materials that enter largely into the construction of buildings, sidewalks, sewers, etc. All these many materials mentioned you have to carry in stock and keep a complete stock all the year. You own horses, wagons, pay for the services of teamsters and warehouse men, saying nothing of maintaining an office force with bookkeeper, stenographer, etc. Your expense is a permanent one for 365 days in the year, and if you do not receive your shipments promptly and deliver your goods as per instructions from the contractor, you are severely criticized. The contractor expects the dealer to furnish him material at all seasons of the year at a low margin of profit, for he knows, as a rule, just what material costs.

In many instances, I do not say all, the dealer has to carry the contractor's account on his books for months and sometimes several years before he can get his money, still the dealer has to pay promptly for all his material within 30 days. It used to be 60 days, but now manufacturers of Portland cement and other building material demand that the bills be paid in 30 days. This, you can see, takes capital and a large one in many cases, especially in the cities where heavy contracts

are being constantly let. The profit to the dealer is a small one in comparison to other lines of legitimate business. The contractor is a man who contracts with either private or public individuals to execute certain work, such as construction of a building or sewer or the paving of a street and other important work, which require building material. There are many contractors scattered all over this country who make a business of turning out building blocks, fence posts, concrete sewer pipe, etc., by the word "contractor," I mean a man who uses cement in any line of work in which he may be engaged.

In large city work it is customary for many contractors to ask the dealers to act as their bondsmen, which naturally puts the contractor under obligations to the dealer, and he buys his material from him, while other contractors are more independent and do not require the dealer's services as bondsmen and attempt to buy their cement direct from the manufacturer. Unfortunately some manufacturers have an idea that the salesmen should sell in every town and secure every contract they go after; it can not be done, for if each salesman obtained every contract he was instructed to secure, his plant could not fill his orders. It is true some manufacturers will quote direct, but the number is growing limited each year, for the best known Portland cement manufacturers have representation in some dealer in every large city, and if they have not, request the salesmen to interest the contractor in their brand and arrange with some one of the dealers to handle the cement if contractors desire this special brand.

I have now gone slightly into detail regarding the relative position of the manufacturer, dealer and contractor, but I have said very little about the salesman, and to be candid with you, it is up to the salesmen to bring about a better and clearer understanding between all parties concerned, for he is fully aware of the situation, and if his firm have confidence in him, his advice will be taken. The trade as a rule knows the traveling representative, and during their business career hardly ever meet the men who are actually at the head of the sales department of a manufacturing plant, unless the general sales agent has at one time been a traveler and solicited their trade. The salesman, knowing the trade and its peculiarities, should have charge of his territory completely, and let all inquiries and complaints be forwarded him to avoid misunderstandings, which cause too much friction and often complete separation between manufacturer and dealer.

There are, indeed, many problems to be solved in the marketing of Portland cement, for in various sections of the country, different conditions exist, manufacturers all prefer to handle their goods through the legitimate dealer and the larger number of contractors prefer to do their business through the dealer.

Now, has it ever occurred to the contractor that when they buy cement direct from the manufacturer that they are also paying the dealer a commission? Ninety-nine per cent of the cement companies of this country that do sell to contractors occasionally, allow the local dealer a commission. Now why is it not just as well for the contractor, and much better for him in fact, to do his business with the dealer. He will have to pay the dealer just as much for the cement and practically no more than the manufacturer would ask, and many times he would buy to better advantage, as the dealer would allow him a reasonable length of time to pay his bill, while the cement companies as a rule would ask cash in advance, or cash with draft, unless the financial reputation of the contractor was fully established.

Cement runs up into money rapidly and naturally manufacturers found that 60 days was entirely too long to leave their accounts open, therefore had to make their terms 30 days.

Many times the dealer can actually sell cement less than the manufacturer. This is due to the fact that the dealer has been wise enough to protect himself for a certain period and at a certain price, though enabling him to sell at a lower figure when the manufacturer is demanding more money, owing to the fact that there is a shortage, and market advancing.

The manufacturer does not always realize what the situation is; many times the salesman is to blame for not fully informing his firm of the situation as he finds it.

I had a problem put to me the other day by a dealer, who is pretty well known in his community, and he said, for instance, the lime in your section of the country, or rather the selling of it, was controlled entirely through half a dozen large jobbing houses, who also had the control of stucco

and hair and some other building materials and so completely had these jobbing houses got the control of these various articles, that if you wanted any of them, and you had to buy cement, you would have to buy your cement as well as your lime from the jobbing houses. I told him I did not believe that the jobbers could force the dealer to buy cement from them if they did not want to, and he said, "Well, what is the dealer going to do? He has got to have lime, and if he wants lime he has got to buy cement from the same jobber. A good many cement men come into his office and he can not buy cement from them. He has to turn them down."

I am simply giving you this instance, and I do not say whether it is true or not; it was merely sighted to me in an off-hand way, but should such a situation actually exist, could you blame the manufacturer from falling into temptation? I can readily understand that the jobber in that case would be very much to blame and a detriment to the dealers, still on the other hand, he is naturally looking out for his own interests, but I am very glad to say to the best of my knowledge, nothing of that kind exists in the part of the country I come from. I never heard of such a thing, and I do not say now that it actually exists anywhere, but should it exist, the manufacturer is placed in a very bad position.

I have now covered the ground to the best of my ability, as to the manufacturing and marketing of Portland cement. The great army of actual consumers of cement are with the dealer and prefer to be with him and buy from him, but if the dealer is inclined to be piggish and inclined to overcharge, the contractor will naturally look elsewhere to buy his cement. In every line of business you will find black sheep, you will find men who are really a detriment to their profession—dealers are not an exception—neither are contractors or manufacturers. Every year is bringing the manufacturer, dealer and contractor closer together. Gentlemen, I thank you.

Mr. Johnson was roundly applauded for his paper and was asked several questions on the subject. The question of jobbers was discussed to some length and Mr. Johnson stated that he had given instructions to his jobbers to sell to dealers only. This same plan is observed by nearly all manufacturers of Portland cement.

H. H. Halliday, of Cairo, Ill., vice president for Illinois of the National Builders Supply Association was called upon for a few remarks. He advocated the affiliation of this association and individual members with the national body. He also spoke on the features and benefits procured by becoming a member. Complaints of members he said were systematically handled through the executive committee and many adjusted quickly and satisfactorily to the complaints.

Mr. Stevens, the oldest user of Portland cement in Illinois, spoke of the first cement he bought and of the work in which it was placed.

H. Dorset, president of the Southwestern Lumber Dealers Association, spoke at some length. He said building material manufacturers needed educating, and the association, if properly supported, would accomplish very beneficial results.

Mr. Hotchkiss spoke of the first work done by the Lumber Dealers Association and the growth of the Illinois Masons' Supply Association. He said the promotion of products was the object. Cement and other materials to get the best results must be intelligently handled and the dealer was the one to do it, as the consumer in many and most cases was not competent. The question of increased membership then came up. W. H. Hunter spoke on the benefits to be derived from the association and how it could be increased and built up so as to be influential.

The Committee on Resolutions made their report which was as follows:

"Resolved, That the hearty thanks of this convention be extended to the officers of this association for the splendid success scored by this meeting and for their untiring labors during the year for the promotion of the association's welfare and the maintenance of its principles.

"Resolved, That sincere thanks be extended to the speakers whose papers have entertained and instructed this association.

"Resolved, That the American Society of Civil Engineers be requested to formulate a set of specifications to meet the requirements of hard plasters. We recognize the specifications for Portland cements as already formulated."

The report was unanimously accepted. The committee on constitution and by laws then re-

ported that the constitution was in need of several changes and revision which they read and the report was accepted.

The Committee on Nominations reported as follows:

For president, Jos. Paddock, of Para.
For vice president, W. E. Terry, of Galesburg.
For secretary-treasurer, E. W. Hogle, Chicago.
Executive committee: For one year term, W. H. Hunter, of LaSalle; for one year term, Jas. Stolze, of Edwardsville; for one year term, T. J. Birmingham, of Galena; for two year term, P. Vredenburg, Jr., Springfield; for two year term, N. E. Halden, of Danville; for two year term, S. A. Holcomb, of Sycamore; for three year term, W. S. Harwood, of Bloomington; for three year term, H. H. Halliday, of Cairo; for three year term, Chas. A. Glore, of Centralia.

The entire ticket was elected unanimously.
Chas. W. Hall introduced the following resolution:

"Resolved, That the thanks of this association are due the publishers of Rock Products for their very kind offer to open the pages of their journal at all times for the promotion of this association, and that we appreciate the presence of their representatives at our convention."

The resolution was adopted.

The secretary then read the resignation of V. H. Park & Son Co., of Decatur. The resignation was as provided by the constitution, referred to secretary and allowed to take the usual course.

The meeting then adjourned.

NOTES OF THE MEETING.

The cement crowd were there in a bunch.

The U. S. Gypsum Co. had the large parlor opposite the convention hall and a very handsome display. The products of the company in their different uses were constructed in a hall and arranged in a very pleasing manner. A large force was in charge to tell of the merits of the U. S. Gyp., among whom were: R. E. Boughman, C. H. Bohanon, A. B. Cook, A. A. Fabritz, B. Chenowith, G. E. Lavelle, S. H. Beard, W. D. Collins, C. C. Quincy, H. J. Schmoeger, L. L. Watson and E. G. Gabel.

When it comes to entertaining at a convention the Marquette Portland cement boys take the prize. Their trio in charge, Robt. Dickinson, W. H. Eckles and Geo. M. Henderson, couldn't be beaten. Their rooms were always crowded for they made every one welcome, and the buffet lunch they served as well as "Marquette" cigars, won the hearts of every one. Incidentally they booked some goodly orders.

B. H. Rader, of the Universal Portland Cement Co., was on hand all the time. He is a specialist on conventions and knows as much about how to run one as he does about the merits of Universal and every one knows that is his long suit.

Dolese & Shepherd Co., had a large exhibit in charge of H. R. Wallbaum, Grant Dewey and J. P. Enright. They were kept pretty busy telling all about "Limene," the product of their plant and they had some interesting information to give on this subject.

The Usona Concrete Fence Post was on exhibition and in charge of F. P. Van Hook.

E. R. and J. M. James represented the Grand Rapids Plaster Co. and had samples of the Sackett Plaster Board to show the conventionites. There was always a crowd around their exhibit listening to the merits of this product.

The Iowa Hard Wall Plaster Co. was represented by Secretary R. W. Merrill and Walter Smith. They handed out a puzzle match safe and pocket book to the delegates.

The Independence Gypsum Co. had an exhibit in their rooms. R. J. Johnston and F. P. Southerland represented the company and they were kept busy telling about Golden Seal and Silver King plasters.

C. L. Ward, representing the Gardiff Gypsum Plaster Co., was on hand and passed out souvenirs in the shape of a match safe.

Bert Swett, of Lehigh fame, was on deck getting acquainted with the dealers. Bert doesn't have any trouble as he is a famous mixer.

The Atlas force was around every minute headed by T. M. Magiff, assisted by Fred Clayton, F. C. Bailey and John Evans who spread the gospel from the Chicago office.

Secretary Bishop and Superintendent Newton of the Marblehead Lime Co. were around shaking hands with their friends and they were kept busy.

A. L. Kanagy mixed with the delegates and never missed an opportunity to tell about Louisville cement.

Jas. R. Dugan and H. J. Pollock represented the Acme Cement Plaster Co., of St. Louis. They said that they would be glad to have standard specifications of plaster made.

W. K. Sawyer, of Rockford, mixed with the crowd and passed out memorandum books.

The Ste. Genevieve Lime Co. had an exhibit in charge of George Hruskg, who made demonstrations for the delegates.

Exhibits at Kansas City.

The nineteenth annual convention of the Southwestern Lumbermen's Association was held last week in January in Kansas City and was one of the most successful in the history of the organization. Many of the lumbermen were also builders' supply dealers and were much interested in the exhibits of various manufactures, some of which are mentioned in the following notes.

L. V. Thayer, president of the Peerless Brick Machine Co., of 100 Lumber Exchange Building, Minneapolis, Minn., probably had one of the most interesting exhibits at the convention. He had one of their famous brick machines in operation, actually making brick. The machine attracted a great deal of attention and was pronounced one of the best and most practical machines ever seen. The lumbermen were particularly interested, because it makes it possible to have a brick yard in connection with their lumber business at a small expense, and judging from the way Mr. Thayer was booking orders, the people in the Southwestern district know a good thing when they see it.

The Ash Grove White Lime Association, with general offices in Kansas City, were undoubtedly the most popular people at the convention. There was not a conventionite who did not know that the Ash Grove people were on deck. They were responsible for the beautiful official badge. This was one of the most elaborate as well as unique badges the writer has ever seen. It was not simply a ribbon with the date of the convention on it, but had a metal pin showing a picture of a lumber yard with a blue ribbon and a bronze charm attached to which was a fac simile of the map of Kansas, Oklahoma, Missouri and Arkansas. They also put out a catalogue which is decidedly different from anything heretofore seen. Each leaf was a little shorter than the other, indexed showing the article represented on that page, making it possible to find the thing which you are interested in, in a second. Their exhibit was very complete and J. F. Pollock, treasurer of the company, who was in charge, endeavored to make every one feel at home in their exhibit room.

The Marble Head Lime Co., of Chicago, Ill., and Kansas City, Mo., was represented by W. H. Stewart, manager of the Kansas City office. Mr. Stewart was presenting his friends with a useful souvenir in the way of a combination pen and pencil.

The Oklahoma Plaster Co., of Alva, Okla., who make the famous "Selenite" plaster, were represented by J. M. Bickel and W. M. Corbett. They had an odd souvenir in the shape of a paper weight made from their product.

The Ozark White Lime Co., of Fayetteville, Ark., were represented by F. O. Gulley, general manager. Mr. Gulley was handing his friends a folder made in the shape of a double door entrance, which when opened up, showed their advertisement.

The Kansas City Roofing and Corrugated Co., of Kansas City, Mo., was represented by K. I. Pottinger, L. W. Pepper, E. L. McVicker, T. J. Harrison

and J. H. Bomer. This was one of the best patronized exhibits in the building as their room seemed to be full of people at all times of the day.

The Iola Portland Cement Co. were represented by R. E. Stapleton, general sales manager, of St. Louis; J. P. Edwards, representing Kansas City; D. M. Burns, representative of Iola, and James A. Wheeler, treasurer. Each and every one visiting the booth received the personal attention of one of these gentlemen, who endeavored to tell them about the virtues of Iola Portland cement and to bring them within the fold.

The American Cement Plaster Co., of Lawrence, Kas., was represented by D. A. Williams, A. D. Mackey, W. W. Mackey, W. G. Ong and Miss L. D. Linton. They put out a souvenir in the way of a knife, which was one of the most substantial seen in the convention. The knife is of oxydized silver finish with razor steel blades; the knife was imported from Germany and is something which will recall to memory the American Cement Plaster Co. to a great many of the conventionites every day in the year for several years hence.

The Independence Gypsum Co., of Kansas City, Mo., was represented by George F. Southerland, president; W. M. Stolz, salesman, Ohio, Indiana, Oklahoma and Texas, and R. J. Johnston, Missouri, Iowa and Illinois.

H. W. Binnie, president, and James H. Binnie, salesman, representing The Heppes Co., Chicago, manufacturers of the Arrowhead No Tar Roofing, do not seem to believe in that old tradition that giving away anything with a point to it cuts friendship, as they were passing out a neat paper knife as a souvenir.

W. H. Jarvis was in charge of the Indian Portland Cement Co.'s exhibit. Mr. Jarvis had a smile and a cigar for every one and was ever ready to tell you about the Indian Brand.

G. W. Randall, treasurer, and J. F. McQuirk, sales agent, were in charge of the American Co.'s booth. The American people manufacture asphalt and rubber roofing of a high quality. They presented their friends with a combination pencil pen.

The U. S. Gypsum Co., who have the reputation of showing a complete exhibit of plaster and the many ways in which it can be used, surpassed all previous records. They had their plaster molded into many pretty designs, one being a statue of liberty which would be a credit to any art hall.

This was one of the busiest, as well as one of the most admired exhibits of the convention, those representing the company at the convention being, C. C. Quincy, of Chicago, general sales manager; F. W. Farrington, Western general sales manager; H. C. Fields, assistant Western sales manager, and C. W. Young, D. V. White, H. E. Randolph, salesmen.

The Kansas Portland Cement Co., of Iola, Kan., was represented by L. L. Northrup. Mr. Northrup was kept busy telling his many visitors about their Sunflower brand of cement.

J. S. Stoner, manager of the Kansas Wood Fibre Plaster Co., Coffeyville, Kan., said the convention was the largest and best he had ever attended, and that the lumberman knew a good thing when they saw it.

F. F. Freeman, treasurer of the Rogers White Lime Co., Rogers, Ark., was present, with his usual broad smile, and ever ready to tell the people about the virtues of his famous brand known as Lilly Lime.

A. Baumberger, representing the Red Wing Portland Cement Co., of St. Louis, said the convention was a howling success from a business standpoint as well as every other way.

The Western States Portland Cement Co., Independence, Kan., was represented by A. Steinmetz, assistant secretary, M. J. Bowdish, W. D. Ege and R. J. Clark. Every conventionite who visited their exhibit received a leather bill book, or an erasing memorandum, as well as a pleasant greeting.

The Malthold Roofing Co., 95 Williams Street, New York, were represented by C. W. Taber, B. S. Mount, Fred T. Lyon and Sam D. North, general manager of New York office, who spent a day at the convention and seemed much pleased with the exhibit, the people and everything in general. He said it was one of the best attended as well as most successful conventions, from an exhibitor's standpoint, that he had ever attended. Their exhibit was elaborate and their "Y NOT'S" attracted attention and seemed to be everywhere in evidence.

Quarries.

Ohio Crusher Operators to Meet.

A meeting of the Ohio Stone Club will be held February 28 and March 1 in Room 301, National Union Building, Toledo, Ohio. The meeting will be called to order at 10 o'clock A. M. A fine program has been arranged covering the two days' session, terminating with a banquet to the visiting members and friends on the evening of March 1. All parties interested in the production of limestone in any form in Ohio are earnestly requested to be present, as business of importance to the stone interests of Ohio will be discussed.

F. K. HOGUE, President.
S. M. HALL, Secretary.

Invitation to Crusher Men Everywhere.

So many parties interested in the stone crushing business have indicated a desire to hold a convention of those who operate stone crushing establishments that it has been decided to invite all such parties to meet at the Auditorium Hotel, Chicago, Ill., March 5 and 6 to form a National Crushed Stone Association. The first meeting will be called at 10 o'clock A. M., March 5. There will undoubtedly be some interesting discussions upon the ever important subject of equipment. The transportation feature will be threshed out from every possible standpoint; the recent developments of great importance to every man who operates a crusher will be gone over carefully so that it will be possible for the delegates to post themselves up with a view toward future improvement of the plant for the purpose of increasing the output and grading and separating the stone in such a way as to increase the profits as well as the volume of business.

The rapid strides with which the crushing business is advancing as an important factor in the structural world in conjunction with the older lines of ballast and macadam should be an incentive sufficient to bring out a large attendance on this occasion. The educational features that will certainly be developed at this meeting will prevent every man who attends from becoming a back number and certainly place him in the lead of those who stay away to carry on their operations day in and day out in the same old way. This is the day of opportunity for the crusher man for with the demand for his product increasing it certainly looks as if it only requires that kind of intelligence which alone can be secured by co-operation and assembled wisdom to pile up a fortune for the man who conducts a stone crushing establishment. Those who are in the business now will make money if they seize the opportunity, which the signs of the times clearly present. It is up to you, gentle reader, to meet with Rock Products and the bunch at the Auditorium Hotel March 5 next, at 10 o'clock. Now, come prepared to give your experience on all the points mentioned above, and out of all the experience represented there will certainly be measures adopted that will largely improve the profit account of every crusher man who is wise enough to accept this invitation and opportunity.

Provide for More Storage.

Perhaps there is no feature of the stone crushing industry that runs up the expense account and stands in the way of progress and in this way makes the profits melt so much as the storage of the product. A year or two ago when the crusher was operated merely as a ballast or macadam producing proposition and when the dust and fine screenings represented an ever increasing pile of dead waste, the storage proposition was not given any consideration at all and the product was run through a chute directly from the screen to the car below while another chute carried away the waste.

Now the well equipped crusher plant is in fact a manufacturing establishment and it will be

more so as time goes on. Operators that are now making three separations of their screenings will soon be considering five or six. It is quite probable that some appliance for washing certain grades of screenings will soon be undertaken and perfected. The marketing of the product of the crusher will grow more complex as it more definitely assumes the features of a manufacturing establishment. The storage of large quantities of the various grades or sizes of rock and screenings is already being considered by the larger establishments and elevated tramways equipped with dump cars are in use in many places, for it has been found that while the operation of the crusher is constantly producing all the various sizes at one time the sales or shipments may not call for every size at the same time and naturally such sizes as are wanted are shipped out first and all the balance goes into storage. The time will surely come when the size that goes into storage today will be wanted in such quantities for prompt delivery as the plant will be unable to produce, if it did not have an accumulation of that identical size in storage. This gives the crusher man an opportunity to enter the field of salesmanship, and places him in a position to take on a larger order for prompt delivery than he would be able to undertake if he had not the accumulation of the goods already on hand.

The cost of rehandling has always been the main drawback in the consideration of placing such heavy material that must be sold at a low price in storage. We heard a crusher man say recently that it never pays to lift crushed rock or screenings of any size once it has left the chutes of the crusher. Now with the clam-shell bucket the locomotive crane or the steam shovel the cost of rehandling can be reduced to such an enormous extent that the cost practically disappears when the size of the operation is sufficiently large. Since there is no limit to the demand there is naturally no limit to the capacity that can be installed at any given crushing establishment always provided, of course, that transportation facilities are favorable for marketing the goods.

Ryan Stone Co. Organized.

TOLEDO, O., February 2.—The Ryan Stone Co., of Waterville, has been incorporated with a capital of \$60,000.00 by Charles W. Ryan, R. C. Roachs, W. M. Gray, Charles R. Bert and Elmer Davis. The concern will take over the stone business of Charles Ryan at Waterville, where there is a large quarry for turning out crushed stone for building purposes. Mr. Ryan owns quarries at North Baltimore, Fremont and several other places and it is his intention to organize a company to operate each one of them.

Make Big Contract.

WAVERLY, IOWA, February 7.—The Cedar River Stone Co. has just made a contract with the C. B. Havens Co., of Omaha, Neb., for 1,000 cars of crushed rock to be delivered in Omaha at the rate of seven cars a day, beginning March 1. The freight will average about \$53.00 a car.

Will Improve Their Plant.

KOKOMO, IND., February 8.—The Kokomo Marion and Western Traction Co. has decided to push the sale of stone from its quarries in this city during the approaching building season, and with that end in view will expend considerable money in enlarging and repairing their plant. The stone from the quarries is said to be of the best quality and commands a ready sale.

Wisconsin Quarry is Sold.

WAUPACA, WIS., February 9.—The Waupaca Granite and Quarry Co. has just closed a deal whereby all the stock of the corporation, held largely by Alton Ripley, of Oshkosh, has been sold to Aggerbeck & Johnson, representatives of Chicago capitalists, who have purchased the quarry for the purpose of operating it to the fullest extent. It is said that between 300 and 500 men will be employed. The concern already has a contract for 100,000 yards of crushed granite. The new owners have started a survey of the grounds for the purpose of making new plans and improvements for the installation of four new granite crushers.

Big Rock Stone and Construction Co.

LITTLE ROCK, ARK., February 13.—The Big Rock Stone and Construction Co. make a specialty of crushed stone and sand. The officers of the company are W. W. Dickinson, president; J. W. Dickinson, Jr., vice president, and C. E. Taylor, secretary-treasurer. Their plant is located three and a half miles from Little Rock on the Iron Mountain road. They own a veritable mountain of blue trap rock which is probably the hardest known stone in general use. The face of the quarry is almost 200 feet in length and the supply is practically inexhaustible. The equipment consists of an Austin No. 7½ crusher and two Gates crushers, No. 5 and No. 3, respectively. The stone is blasted and is very hard to crush. It is used for rip rap and foundation work. The whole of the output is handled in cars and fully 75 per cent of it is shipped to points outside of Little Rock. This company also controls a sand bar, about one-half a mile from the quarry, across the river. They have four steam driers for the purpose of drying their material.

Had a Successful Season.

BLUE SPRINGS, NEB., February 1.—G. H. Davis, successor to Davis & Mayne in the stone crushing business here, had a prosperous season despite the fact that his plant was destroyed by fire September 5, 1906, and that he was greatly delayed in having the plant rebuilt. He was delayed four months in getting the lumber from the Pacific Coast. It took one month to fill the order, another month to get cars, and two months in transit. The lumber is now on hand and two crushers are in place. He hopes to be ready for business when the season opens. He shipped 1316 cars of stone of all kinds during 1906 as against 1364 in 1905. He says that notwithstanding the loss of his crusher his shipments for 1906 would have exceeded those for 1905 had he been able to get cars for loading.

Prospects are Bright.

BRAINERD, MINN., February 1.—The New Ulm Stone Co. had many difficulties to contend with during the past year on account of scarcity of labor and other things, but the officers regard the season as having been satisfactory. During 1906 the company delivered 329 cars of crushed stone and twenty-nine cars of building stone. The concern has orders for this year already totaling about 8,000 yards.

The Rock Crushing Co., of Quanah, Tex., has been incorporated by J. W. Golston, P. A. Alverson, J. R. Sanders, W. R. Dupuy and T. J. Rogers, with a capital stock of \$5,000.00.

The St. Joseph and Grand Island is establishing a ballast plant at Marysville, Kan. A big rock quarry is being opened and a crusher will be installed.

The Davis Trap Rock Co., of 419 Market Street, Camden, N. J., has been incorporated with a capital stock of \$250,000.00 by James T. Davis, John Lamont and Roland W. Davis.

The Fanwood Stone Crushing and Quarry Co., of Scotch Plains, N. Y., has been incorporated with a capital stock of \$100,000.00 by William H. Weldon, Frank E. Weldon and John Z. Hatfield.

The Flint Hill Quarries, of Troy, N. Y., has been incorporated by C. M. McMurray and A. P. McKeon, of Troy, and C. E. Parsons, of Albany, with a capital stock of \$40,000.00.

The Eureka Crushed Rock Co., of Los Angeles, Cal., has been incorporated with a capital stock of \$200,000.00 by Carl Leonhardt, John A. Murphy, H. E. Dillon, J. B. P. Crosby and W. G. Bertelsen.

The Michigan Alkali Co., of Alpena, Mich., will install a crusher that will have a capacity of 3,000 tons of crushed rock a day.

A bill has been introduced in the Wisconsin legislature appropriating \$25,000.00 for experiments in road building.

Sacramento, Cal., will need much crushed rock this season because of the great amount of street work to be done. Fears are entertained that on account of inadequate transportation facilities a sufficient quantity can not be obtained.

The Northwestern Railroad Co. has purchased a large tract of land near Peebles, Wis., and will establish a large stone crushing plant there.

Lime.

The National Lime Manufacturers' Association.

Meets Semi-Annually

Peter Martin, Huntington, Ind. President
A. A. Stevens, Tyrone, Pa. First Vice President
W. E. Carson, Riverton, Va. Second Vice President
T. E. Fleischer, Sheboygan, Wis. Third Vice President
C. W. S. Cobb, St. Louis, Mo. Treasurer
E. H. Debebaugh, Louisville, Ky. Secretary

Official Organ, ROCK PRODUCTS.

Literature of Lime Industry.

The manufacture of lime is one of the oldest industries known to man and it is remarkable that from the dawn of history up to the present generation there was little, if any, improvement in the method of producing this indispensable material and though universally used wherever man has inhabited the globe, practically no literature exists upon the subject in any language that dates back over fifty years. However there has been no lack of study upon the subject by the progressive element of the present generation and the National Lime Manufacturers' Association has certainly produced in its annual meetings during the past few years a number of valuable papers which constitute a digest of the development of the industry up to date. The result of this new literature upon the subject of lime has been the rapid introduction of improved methods and systems by better equipment of the plant so that an era of progress has been inaugurated.

There is no member of the association who has not profited in big numbers by the educational features developed in the discussions of these conventions, although some of the brighter minds feel that they have merely received a confirmation of opinions previously formed in their own minds. The enormous progress represented by the introduction of the hydrating proposition now so rapidly becoming established and popular at all important markets for building material has received no little attention by the leaders of the industry who are the members of the association and these are the men who are now plucking the first fruits of the only radical improvement in the manufacture and marketing of lime that has ever been attempted. Still, there are some who say they can't see the benefit and they might not see the advantage of the incandescent lamp over the old time candle because it costs more and is more trouble to provide.

What is Your Lime Good For?

To the layman lime is lime, but to the expert who manufactures it magnesia lime is different from calcium. We sat listening to a couple of experts the other day. One said, "Now, you notice our lime only runs about 53 per cent pure lime, but in hydrating it we find it is much more valuable for the building trade in that it makes a good finish as well as a wall. Now when you are hydrating a high magnesia lime you will find that while it is all very well for sand-lime brick or for ordinary uses, when it comes to the lime finishing stage, you don't get the best results." Of course we think this wise gentleman, who was making this talk, was somewhat prejudiced, but there is a whole lot in the fact that certain limes are particularly good for certain purposes and a man who has a stone that runs low in calcium ought to find out exactly what his stone is good for and cater to that trade. Of course we are all anxious for business and will possibly overdraw the proposition without meaning any harm in order to get the business, but for the good of the cause it is much better to use material for what it is particularly applicable and the price ought to go up accordingly.

Banquet to Retail Dealers.

The lime manufacturers of Western Pennsylvania extended the usual annual courtesy of a banquet to the retail dealers of Philadelphia, which was held at the Bellevue-Stratford Hotel, Philadelphia, Thursday evening, January 17, 1907. Practically all the manufacturers and dealers were represented, 65 being present.

William B. Irvine, the dean of the lime manufacturers of that section, presided and F. A. Daboll acted as toastmaster.

Speeches were made by Messrs. Durnell, of the Lyster Supply Co.; Moore, of the De Frain Sand Co.; Chas. C. Cox, president of the Retail Dealers' Association and others.

The meeting was in session from 8 o'clock until 12 o'clock P. M. and was pronounced by all present the most enjoyable of its kind yet experienced by the manufacturers and retailers. The associations have been co-operating along these lines for nearly four years with additional success each succeeding year.

The output of lime represented in this association, some 4,000,000 bushels in 1906, was handled to the general satisfaction of the trade, owing to the co-operation of these two associations. As an evidence of the general improved conditions and of good fellowship, it is interesting to note that during the past twenty-five or thirty years three of four lime associations have been started which went to pieces within a very few weeks, due to lack of co-operation. The principle of the manufacturers and retailers co-operating for the general good of the trade, has never been better illustrated than in Western Pennsylvania.

Lime Manufacturer Dead.

FREDERICK, MD., February 12.—M. J. Grove, president of the M. J. Grove Lime Co., of this county, and of the Grove Lime and Stone Co., of Washington, died suddenly recently at his home at Lime Kiln, this county. Though 83 years old Mr. Grove had maintained his vigor to a remarkable degree and was still the active head of the company he founded. He began the manufacture of lime at Lime Kiln four miles from this place, in 1859 and the business had gradually expanded up to the time of his death.

Lime Plant for Wyoming.

FORT COLLINS, COL., February 1.—A company is being organized here for the development of the limestone quarries in Granite canyon located between Cheyenne and Tie Siding, Wyoming. An expert has visited the quarries and reports that a limestone high in lime is found in unlimited quantities and that a high grade of lime was manufactured there at one time. The only objectionable feature is that the wind down the canyon is variable. The lime used in Colorado at present is imported from Missouri and Texas.

Notes of the Trade.

The Garrigan Lime and Stone Co., of Bellevue, O., has been incorporated with a capital stock of \$60,000.00 by Paul J. Ragan, Leigh W. Storey, G. P. Hahn, D. L. Beatty and George W. Fell.

The Union Stone and Lime Co., of East St. Louis, Ill., has been incorporated with a capital stock of \$50,000.00 by Melville B. Coburn, Thomas L. Fekete and William D. Coburn.

Scarcity of lime on account of car shortage seriously interfered with building operations in Atlanta, Ga., during the month of January.

The Champlain Valley Lime Co., of Burlington, Vt., has been incorporated with a capital stock of \$35,000.00 by Ellen W. Catlin, Frank S. Weston, George B. Catlin, Ina B. Catlin, Edward H. Weston.

The Union Lime Co., of Los Angeles, Cal., has been incorporated with a capital stock of \$50,000.00 by F. O. Wyman, E. B. Wyman, G. M. North, W. J. Bailey and Dell J. Newton.

The Calera Lime Works, of Montgomery, Ala., has been incorporated with a capital stock of \$10,000.00 by O. Moss and W. H. Moss.

The Woodville White Lime Co., has leased rooms 1323-1324-1325 in the Nicolas Building in Toledo, O., and will make its headquarters in that city.

NATIONAL LIME MEETING.

Interesting and Profitable Session is Held at Columbus With Large Attendance.

IMPORTANT MATTERS DISCUSSED.

Early Monday morning, February 4, the delegates to the meeting of the National Lime Manufacturers' Association at Columbus, Ohio, were slow in arriving because the trains were all late and the Executive Committee and the secretary were somewhat disturbed about the attendance. But the lime men came just the same and had a fine meeting. The roll call showed the following gentlemen present:

THE ATTENDANCE.

Chas. Warner Co., Chas. Warner, Wilmington, Delaware.

Rock Products, E. H. Defebaugh, H. B. Warner, Louisville, Ky.

Kritzer Co., C. C. Kritzer, Chicago, Ill.

Dolese & Sheperd, H. E. Bachtenkircher, Chicago, Ill.

A. & C. Limestone Co., J. C. Armfield, A. B. Meyer, Indianapolis, Ind.

Ohio & Western Lime Co., Peter Martin, Huntington, Ind.



G. M. CHRISTIAN, SR.

The Union Mining Co., Chas. H. Claiborne, Mt. Savage, Md.

Robert S. Edwards, Boston, Mass.

George Nicholson, Jr., Manistique, Mich.

Clyde Iron Works, C. S. Bruce, Duluth, Minn.

Peirce City Lime Works, Capt. W. A. Raup, Peirce City, Mo.

Goetz Lime and Cement Co., Phil J. Dauernheim, Gordon Willis, St. Louis, Mo.

Hunkins & Willis Lime and Cement Co., F. P. Hunkins, B. Hunkins, St. Louis, Mo.

Ste. Genevieve Lime Co., W. H. Brebener, St. Louis, Mo.

Glencoe Lime and Cement Co., C. W. S. Cobb, St. Louis, Mo.

M. S. Holman, St. Louis, Mo.

Walter Sheldon, Hamburg, N. J.

Combustion Utilities Co., Carleton Ellis, Farmington-Cheshire Lime Co., H. M. Brigham, Mr. Mangelsdorf, L. M. Palmer, Jr., New York City.

H. L. Carey, Watertown, N. Y.

Rochester Lime Co., F. C. Lauer, Rochester, N. Y.

The Norris & Christian Lime and Stone Co., Geo. B. Christian, Sr., Marion, O.

W. H. Kemler, Ashland, O.



P. J. DAUERNHEIM.

Dupont Powder Co., S. M. Denison, Cincinnati, O.
Kelly Island Lime and Transport Co., Lawrence Hodgkiss, Cleveland, O.

Ingersoll-Rand Co., C. A. Burgess, Cleveland, O.
S. V. Peppel, Columbus, O.

Scioto Lime and Stone Co., James Reaney, Jr., H. E. Kendrick, Delaware, O.

Commercial Artificial Fuel Co., F. J. Bulask, Toledo, O.

Doherty Co., Thos Doherty, Toledo, O.

Woodville White Lime Co., J. J. Urschell, Frank Urschell, Toledo, O.

S. W. Shoop & Co., S. W. Shoop, A. Z. Pote, Altoona, Pa.

Duff Patents Co., A. H. Bradley, Pittsburg, Pa.

A. H. Laumen, Pittsburg, Pa.

B. E. Culter, Pittsburg, Pa.

J. C. Paxton, Toms Brook, Va.

J. K. McClanahan, Tyrone, Pa.

Riverton Lime Co., Frank Cruddon, Riverton, Virginia.

Milwaukee Falls Lime Co., A. C. Tews, Western Lime and Cement Co., Chas. Weller, Milwaukee, Wisconsin.

Sheboygan Lime Works, T. E. Fleischer, Sheboygan, Wis.



COL. C. W. S. COBB.

President Martin made an unusually strong talk urging manufacturers of lime to participate in organization of the highest character and not only to contribute their mite and money but also to add influence and suggestion that the National Lime Association, which had a nucleus for the strongest organization in this country, might be awakened to its possibilities and a greater organization effected which would absolutely insure the widening of the market, and advancement of technical interests and the improvement of methods.

Secretary Defebaugh delivered a few hot shots which were practically an enlargement of a talk he gave the lime trade through Rock Products in the December issue, but when he got through every man was nervous and the handwriting on the wall indicated that there would be something doing before this convention adjourned for an enlarged effort.

The program was carried out and Treasurer Cobb reported a good balance on hand with additional assets and the association in good financial condition, notwithstanding the lack of interest by some of the members.

Addresses were made during the convention. One by Col. George B. Christian, of Marion, Ohio, on how to operate a quarry economically and get a regular daily supply of stone and keep the face of the quarry in good condition, was especially interesting. The Colonel gave his experience in an attractive way.

C. A. Burgess, of the Ingersoll-Rand Co., of Cleveland, O., made an interesting talk on "Mechanical Appliances in the Quarry," and added to the wisdom of the manufacturer in quarrying methods.

Charles Warner, of Wilmington, Del., told of the "Advantage of the Steam Shovel in the Limestone Quarry, from Observation," and dropped some interesting information as he always does when he gets on his feet.

W. E. Carson, of Riverton, Va., spoke on the subject "The Throttle Valve of the Lime Plant," and was congratulated by all present on his great effort.

Walter Sheldon, of Hamburg, N. J., in his talk on the "Developments of the Lime Business," interested every man present.

F. J. Bulack, Toledo, O., talked on "Peat Fuel for Lime Burning," and gave some new thought on the fuel proposition.

R. S. Edwards, of Boston, made an excellent address on the subject of the "Problems of the Lime Manufacturer."

These papers were full of good things and there is not a man in the lime trade who can afford to do without them. However, after discussing the lack of interest of many, it was concluded that only members of the association in good standing would be entitled to these papers and that is why a more complete report of the proceedings is not given in Rock Products.

The officers selected for the conduct of the Association's business for the coming year are as follows:

President, Peter Martin, Huntington, Ind.
First vice president, A. A. Stevens, Tyrone, Pa.
Second vice president, W. E. Carson, Riverton, Virginia.

Third vice president, T. E. Fleischer, Sheboygan, Wis.

Treasurer, C. W. S. Cobb, St. Louis, Mo.

Secretary, E. H. Defebaugh, Louisville, Ky.

Board of Directors: A. Newton, Chicago, Ill.; R. C. Brown, Oshkosh, Wis.; F. P. Hunkins, St. Louis, Mo.; A. Courchesne, El Paso, Texas; Wallace Canfield, Canaan, Conn.; Walter Sheldon, Hamburg, N. J.; Lawson Moores, Cincinnati, O.; W. B. Hill, Kansas City, Mo.; Phil J. Dauernheim, St. Louis, Mo.; Chas. Weller, Milwaukee, Wis.; Chas. Warner, Wilmington, Del.; James Reaney, Jr., Delaware, O.; L. M. Palmer, Jr., New York City; A. B. Meyer, Indianapolis, Ind.

The hot shot and shell thrown into the meeting by the officers about the lack of interest and the desire to get the co-operation of every man in the lime business secured for the trade a fund of nearly \$2,500.00 in addition to dues from those present and a request has been made of the lime trade of the United States to come to the aid of the association and contribute to this fund which it is hoped will reach \$10,000.00 to conduct that National Lime Association on the most modern methods and gain that benefit which can only be secured by the co-operation, financially and morally and personally, of every lime man.

To show the interest all along the line the meeting continued from 10 o'clock in the morning until nearly 11 o'clock at night, and your uncle Peter and the secretary had trouble in warding off the body blows the manufacturers gave because this meeting was not continued over the second day, and when it adjourned it was with that lack of wanting to quit talking it over that gave encouragement to all.

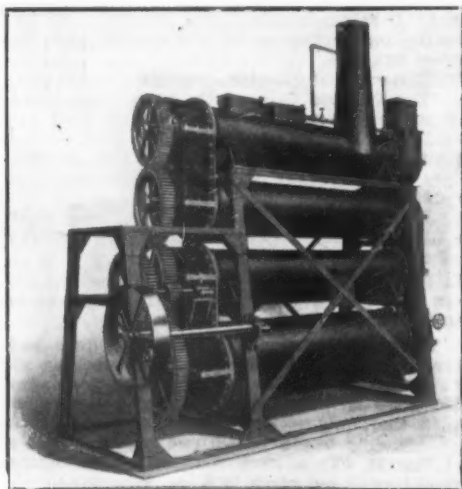
On authority of the meeting the Executive Committee and officers are to meet early in March to secure the services of an A-1 man to give his attention to the promotion of the organization and members can look forward to receiving some red hot communications or a personal call.

But this is what we want of you right now. First we want you as a contributor. If you are not in good standing in the association get in line and then give us your suggestions and your personal interest in everything that can possibly enlarge the scope of the lime trade and benefit the individual, and the twelve months coming will show you what is in store for the trade where progressive action is taken.

The minutes complete will be placed in the hands of those in good standing in the association within the next two weeks.

Kritzer Continuous Hydrator.

One of the latest booklets that have come to the editor's desk lately tells all about the newest inventions in that most interesting department of the modern development of the lime industry, the hydrating proposition. Charles C. Kritzer steps out into the actual and practical limelight as the



KRITZER CONTINUOUS HYDRATOR.

inventor of the Kritzer continuous hydrator, which is built as its name indicates to hydrate lime continuously and to keep it up for twenty-four hours a day, if necessary. It represents no little study culled from practical experience on the part of the inventor in installing a large number of the most successful hydrating plants in existence. It represents all the development that practice suggests as being desirable and has been designed especially to increase the volume of output and at the same time secure all the essentials of perfect hydration. The inventor has concentrated his attention to the study and perfection of the hydrating proposition for years and offers in this machine the results of all his efforts and claims and is prepared to guarantee a pronounced improvement that can be definitely counted in the profits of the concern operating the continuous hydrator in the Kritzer way.

Will Install Hydrating Plant.

LITTLE ROCK, ARK., February 18.—Leiper & Mills, manufacturers of the Star brand of white lime and dealers in builders' supplies at 114 East Elm Street, have their lime kilns at Limeville, Ark., about 119 miles from Little Rock on the Iron Mountain. The present capacity of the plant is about 500 barrels of lime a day. They will shortly install a hydrating plant. Their builders' supply business has been satisfactory, except that the wet season retarded building to some extent.



KILN, ORCAS LIME CO.

Lime Plant in Far West.

The sanctum of ROCK PRODUCTS was recently favored by a visit from W. R. Dally, of Spokane, Wash. He is a lime operator in the far West, being the sole owner of the Orcas Lime Co., and he is also a dealer in builders' supplies with extensive warehouses in Spokane, Tacoma and Seattle. The plant of the Orcas Lime Co. is located on Orcas Island in Puget Sound where they secure a very high calcium lime rock making a lime that is 99 per cent pure. The company was organized to burn lime several years ago and Mr. Dally has been interested from the start and now controls the entire operation. The accompanying illustration gives a very clear idea of the rock quarry which is located on the top of a hill so that the rock comes down from the quarry to a charging car which conveys it by means of a trestle to the kiln. The kiln is also located in a niche in the mountain side so that the lime is loaded directly on board the vessels for transportation down the mountain side. Practically all the lime is shipped in coopersage since it must be handled aboard ship. But one kiln is operated as shown in our illustration and the firing is done with wood, a good supply of which can be had right at hand. The regular capacity of the kiln is about 3,000 tons a month. Mr. Dally handles a large percentage of the lime in his own supply business in the three great cities in the State of Washington. He is the Washington agent of the Iola Portland Cement Co. and carries a full line of builders' supplies in his three establishments.



TRESTLE FROM QUARRY TO KILN, ORCAS LIME CO.

Mortar Mixing Plant.

TOLEDO, O., February 4.—A. R. Kuhlmann, vice president of the Toledo Builders' Supply Co., which has offices in the Spitzer Building and distributing depots at various places about the city, is at present working out a plan for the erection of a mortar mixing plant. Mr. Kuhlmann states that his plant, when built, will be the only one of the kind in the United States, and had it not been for several contractors over-bidding the project, it would have been erected last summer and would now be in operation.

Since, however, active building operations were delayed at that time, they are awaiting the installation of a hydrating proposition before finally determining upon the plan to be followed in building his mixing plant. Delay will not be allowed longer than till late this summer for it is the intention of both Mr. Kuhlmann and his company to have the plant in operation for the early building period of 1907.

The plan to be followed will differ only from the former plan in that the slacking bin will be eliminated, this having been necessary where bulk lime was to be used. The building is to be between two and three stories in height and will have an unlimited capacity, or in other words it would turn out more than enough mortar to supply Toledo.

The interior structure of the building will be as follows: Near the top of the building is to be the lime bin, the lime being elevated there by means of a bucket elevator so arranged that an entire load of lime can be dumped into the receiving bin at the bottom at one time. From the



QUARRY, ORCAS LIME CO.

lime bin, the lime is carried by chutes to the slacking bin. Here it is allowed to slack, water being supplied by a tap from the city water mains. In another part of the building and somewhat lower than the lime bin, is located the sand bin, the sand being elevated by much the same method as the lime. By means of a chute the sand is screened and carried, as wanted, to a platform situated beside the slacking bin. Here are men who mix the lime and sand, but Mr. Kuhlmann is working on a plan whereby this mixing will be done entirely by machinery as it is partially done in the present plans by means of screw conveyors which also carry the mixed mortar to the mortar bins, which in turn are situated beneath the mixing platform. These are three in number and each has a capacity of 150 cubic feet. The lime bin has a capacity for 750 cubic feet.

Each of the mortar bins is located over a drive way and is controlled by a slide dump which can be handled by the driver on the wagon. Accordingly, when a load of mortar is desired, all that is necessary is to drive beneath one of the mortar bins, pull a lever and in a minute drive away with the wagon filled. By means of the different mortar bins, different grades of mortar may be secured as the screens which screen the sand on its way to the mixing platform are so regulated as to provide such grades as may be desired.

Cement.

European Cement Activity.

Some interesting figures as to European cement activity are given in the *London Times*, which says that the stagnation in 1905 has given way to a decided improvement, both in Great Britain and the continent of Europe. This paper goes on to say that "demand has fully overtaken production, prices are improved and still tending upwards and manufacturers are accumulating unfilled orders. The San Francisco rebuilding needs created an unusual demand for cement, but before that there were unmistakable signs of recovery."

During the year 1905 the total shipments from the United Kingdom to the United States amounted to 11,590 tons, and in 1904 to 5,073 tons, while for the seven months ended July 31, 1906 they had already reached the comparatively large total of 60,932 tons. The total British exports in 1905 amounted to 456,558 tons, while the exports for the first seven months of 1906 were 385,551 tons. The maximum annual production of Portland cement in Great Britain is estimated at about 3,000,000 tons.

Belgium exports annually considerable larger quantities of cement than Great Britain, the total for 1905 being 679,426, and for 1904 558,295 metric tons. For the first six months of 1906 the exports amounted to 380,556 tons. It is claimed on behalf of the Belgian exporters that by prompt action after the earthquake at San Francisco they secured the lion's share of the newly created business with that city.

But the export figures for the six months to the end of June in 1906, show that the shipments from Belgium to America fell short of what was shipped from Great Britain, being 41,332 metric tons, against 49,540 long tons from Great Britain. A productive capacity of the thirteen syndicated mills in Belgium is about 700,000 tons per annum, and at the present time these mills are turning out a full production.

The German cement manufacturers have been the chief competitors with certain markets, the most pronounced success being with America. In 1902 the German exports to the United States amounted to 246,730 tons out of total American imports of 699,380 tons, largely met by local manufacture, which reduced the exports from Germany to 88,043 tons in 1905, out of a total import of 617,891 tons. The recovery in the German cement trade is as clearly marked as in England, being helped by the extraordinary activity in the German building trades. The works of the several syndicates are being pushed to the fullest extent. The German exports for the first half of 1906 amounted to 303,626 metric tons, of which 71,288 tons went to the United States, against 46,556 tons the first half of 1905.

Cement Production of Michigan.

The Labor Bureau of the State of Michigan has given out figures which show the big growth in this industry in the Peninsula State. According to these figures the total output of Michigan cement plants in 1906 was 4,032,418 barrels, an increase of 1,527,108 barrels over 1905. The total amount of capital invested in these plants is given as \$8,300,000.00 and the number of factories is seventeen. It is said that there is enough marl in sight to run the mills a century and every Michigan mill will increase its output this year. 2,087 men are employed in the manufacture of cement in Michigan and \$1,397,600.00 is paid out annually in wages.

An Immense Sidewalk.

Richard K. Meade, who is chemist for the Dexter Portland Cement Co., of Nazareth, Pa., is authority for the statement that if the Portland cement manufactured in the United States during the past year were made into a sidewalk nineteen feet wide it would make a belt around the world.

Notes of the Trade.

Ground was broken February 4 for the new million dollar plant of the Southern California Portland Cement Co., at West Riverside, Cal.

The Lawrence Cement Co., of Siegfried, Pa., is enlarging its plant by the addition of a new engine, boiler and bowl mill.

The Fordwick Cement Co., of Virginia, has purchased the cement works at Longue Point, near Montreal, Can., and will establish a plant at a cost of \$2,000,000.00. It is said that the plant's capacity will be 6,000 barrels a day. It is planned to have the plant in operation in time for the fall season.

The Lehigh Portland Cement Co., of Allentown, Pa., has increased its capital stock from \$3,794,850.00 to \$7,731,750.00.

J. Fenton Thomas has been appointed receiver for the Round Top Cement Co., of Hancock, Md. Liabilities are about \$100,000.00, but no appraisal has yet been made of the assets.

John W. Eckert, founder and manager of the American Cement Co., has been elected president of the Allentown, Pa., fair.

An automatic testing machine has been installed at the Oregon Agricultural College, Corvallis, Ore., where cement rock will be tested free of charge to residents of Oregon.

The Glen Falls Portland Cement Co., of Glen Falls, N. Y., has closed a contract with the Hudson River Electric Power Co. for power for five years, and after April 1 its plant will be operated by electricity.

P. Gardner Coffin and J. W. Kittrell have been re-elected president and secretary-treasurer respectively of the Catskill Cement Co.

The Huron Cement Co., largely an organization of Michigan Alkali people, has been incorporated at Detroit with a capital stock of \$1,200,000.00, by B. F. Berry, J. B. Ford, H. J. Paxton, S. T. Crapo and E. L. Ford. The plant at Alpena, now in course of construction, will have a capacity of 3,000 barrels a day.

The Hecla Portland Cement Co., of Bay City, Mich., may open a quarry in Alpena, Mich., shortly. It has already purchased a boat to handle the product of the quarry to its mills.

The stock and bag rooms of the mill No. 2, Lehigh Portland Cement Co., Mitchell, Ind., were totally destroyed by fire the night of January 23, with a loss of \$325,000.00. The destroyed building will be rebuilt at once.

The Alsen Portland Cement Co., of Hudson, N. Y., has contracted with the Berlin Construction Co., of Berlin, Conn., for improvements at its plant to cost \$17,700.00 and to be completed by March 30.

Douglas H. Gordon, of Baltimore, is said to be at the head of a company to establish a cement plant near Bissell, Md., at a cost of \$500,000.00, where there are said to be large deposits of limestone. Shale will be shipped from Williamsport.

It is reported that the Southern Cement Co.'s plant at Ensley, Ala., will resume operations in a few weeks after an idleness of three years.

At the annual meeting of the Consolidated Rosendale Cement Co., of Syracuse, N. Y., Edward Coykendall was elected president; H. C. Soop, vice president; H. H. Flemming, secretary, and J. Graham Rose, treasurer.

The Wisconsin Portland Cement Co. is having plans drawn for a cement plant which will be erected at Portage, Wis., at a cost of \$400,000.00.

The store house of the Penn Allen Cement Co., at Nazareth, Pa., was destroyed by fire January 21 with a loss of \$20,000.00.

Dr. J. A. Dean, of Catskill, N. Y., is suing the Alsen American Portland Cement Co. for \$15,000.00 damages to his farm by reason of the dust from the cement plant.

Fifty houses have been constructed by the Iola Portland Cement Co., of Texas, near the company's plant in West Dallas, Texas, to house its employees.

The Rutland Lime Co. has been formed at Christiansburg, Transvaal, with a capital of \$40,000.00 to manufacture Portland cement.

The Michigan Trust Co., of Grand Rapids, Mich., receiver for the Great Northern Portland Cement Co., has been authorized by the United States Court to issue receiver's certificates to the amount of \$75,000.00 for the purpose of starting and operating the company's plant near Marlborough.

The Indianapolis office of the United States Cement Co. has been moved to Bedford, Ind.

At a recent meeting of the stockholders of the Crescent Portland Cement Co. it was decided to increase the capital stock from \$150,000.00 to \$1,000,000.00 to provide funds for the erection of a new mill. W. J. Prentice, formerly president of the Castalia Portland Cement Co., was elected president of the Crescent.

Pioneer Cement Man Dead.

SYRACUSE, N. Y., February 3.—Thomas Millen, one of the first manufacturers of Portland cement in the country, died at his residence in this city last week at the age of 75 years. He had had Bright's disease twelve years, but his condition was not considered serious until about January 1, since when he has been confined to his bed. Mr. Millen was born at Camillus. He was president of the Thomas Millen Co., organized six years ago to succeed Millen & Sons. The company has cement works at Jamesville, this county, and at Wayland, Steuben County.

Prior to going to South Bend, Ind., thirty years ago Mr. Millen was a member of the firm of M. G. Field & Co., which had a stone and sewer pipe plant in South Avenue. At South Bend he started a branch factory for M. G. Field & Co., and a year later bought out the company here. Three years later he began the manufacture of Portland cement at South Bend. He lived at South Bend twelve years.

When the company's orders grew beyond the output of the plant he started the cement works, at Warner, now owned by the Empire Portland Cement Co. After the plants at South Bend and Warner had been disposed of those at Jamesville and Wayland were established sixteen years ago. Eighteen years ago Mr. Millen returned to Syracuse and had since lived there.

Mr. Millen was a member of the Citizens Club, Central City Council of the Royal Arcanum and North Syracuse, Lodge of the F. and A. M. He is survived by his wife, two sons, Duane Millen, of Syracuse, and Homer C. Millen, of Detroit, Mich., and two daughters, Mrs. William H. Wiltse and Mrs. A. J. Campbell, both of Syracuse.

Alpena Suffers Big Fire Loss.

Fire almost completely destroyed the plant of the Alpena Portland Cement Co., Alpena, Mich., on the night of February 19. The fire started in what is known as the "raw" end of the mill and destroyed the kiln room, clay house and coal grinding room. The entire plant was covered by \$200,000.00 insurance and the loss is said to be about 90 per cent of that amount. Repairs had been in progress at the mill for several weeks. It is expected that the mill will be rebuilt as soon as possible.

The Cement Machinery Co., of Jackson, Mich., well known manufacturers of high grade concrete block, brick, post and mixing machinery, are continually adding new and up-to-date machinery to their list of machines, the latest being two more sizes of the Favorite mechanically tamping sand cement brick machines. For the man who does not wish to go into the extensive manufacture of cement brick, but desires the machine for making a few stock brick, and more especially for making the large assortment of ornamental designs that can be made with the Favorite machine, this concern has placed upon the market their Favorite mechanically tamping five-brick machine No. 3; also their two-brick machine No. 4. All of the ornamental designs are interchangeable with these smaller machines just the same as they are with the larger and the same quality and style of work can be done. Those desiring further information will please take the matter up with this company and they will be glad to furnish same.

Concrete.

Association Should Broaden Out.

No well qualified student of human development could attend the sessions of the great Chicago convention without regretting that the educational advantages developed, discussed and perfected by the participating testimonies of well qualified practical men should be confined to the small number represented by the attendance to which may be consistently added a much greater number of interested parties who are qualified to understandingly read the papers and the discussions.

While the attendance in Chicago was large indeed, and those who will read the papers and comments, will certainly number several thousand, there is a still a great field for the larger growth and wider usefulness for the National Cement Users' Association. Undoubtedly, the best talent engaged in concrete operations in this country was assembled to a man at the Chicago convention, the few absentees being so well represented that no important factor was missed. The value of such an assemblage would be multiplied if the association idea could be worked out to perfection. Already quite a number of local, state and sectional associations have spontaneously sprung into existence on account of the clearly apparent need of the careful development of local information with regard to every feature of the concrete industry.

The concrete interests of the city of New York, St. Louis and Louisville have formed local organizations to act in conjunction for the promotion of the concrete industry, the development of the most approved methods and the attainment of the highest possible excellence. In the State of Iowa and in the State of Nebraska there have been organized State Associations, working specially with the materials at hand for the making of concrete within their distinctive jurisdiction. The Northwestern Cement Users' Association is nearly as old as the national body itself and covers the States of Minnesota, Wisconsin and the two Dakotas, largely upon the same basis of the state associations in Iowa and Nebraska. Now all of these local state and sectional associations (many more will be organized in the near future) should be directly affiliated with the National Cement Users' Association by well qualified representatives attending the national conventions reporting the proceedings and features developed to the national body, so that the progress developed by the local association, the state and sectional associations, may be added to and become a part of the National Cement Users' Association's equipment for further advance. This centralizing of all the information developed in every part of the country by the national organization is its chief field of usefulness, for it will rapidly accumulate the power to decide authoritatively all possible questions involved in concrete structural propositions.

The national association needs the co-operation and assistance of all local, state and sectional organizations, as well as the individuals who are rapidly assuming an important position in the perfection of the new ideas of construction that have already revolutionized the opinions of the ages. The representatives of the most advanced thought, the most modern, intelligent and efficient faculty in practical construction, can no longer afford to proceed on separate though parallel paths. Concentration becomes necessary as greater things loom up upon the horizon to be undertaken.

Nebraska Cement Users.

The Nebraska Cement Users' Association held their second annual convention at Grand Island February 8 and 9. There were about one hundred concrete stone block and brick men in attendance and a number of agents representing machinery designed for the manufacture of concrete commodities and for the use of cement users. Papers were read and discussed on "The Curing of Cement by Steam," "Concrete Blocks in General," and other subjects of interest to the practical ce-

ment users. Professor O. V. P. Stout, of Nebraska State University read a paper on "Re-inforced Concrete." Officers were elected as follows for the ensuing year: L. E. Porter, of York, president; R. B. Smith, of Lexington, first vice-president; W. F. Roney, of Grand Island, second vice-president; I. E. Walenpaugh, of Weston, secretary and treasurer. Members of executive committee Frank Burger of Hastings, D. M. Clock, of South Omaha, S. R. Leprack, of Lincoln, W. M. Megrew, of Crete, and Peter Palmer, of Oakland.

W. F. Roney, who was elected second vice-president of the association was the manager of the preliminary arrangements for the convention and to his personal efforts not a little credit is due for the pronounced success of the convention. A large number of machines were on exhibit and this feature was a matter of leading interest to the attendance at the convention. Mr. Roney said that the concrete industry in the State of Nebraska is growing in interest and importance every day and the number of people interested in concrete construction and the workings of the association clearly indicates that concrete will soon be the principal building material employed in the state of Nebraska, for lumber is growing scarcer and higher in price every day and concrete is the only possible substitute that has the necessary requisite of universal adaptability.

Water-proofing Concrete Blocks.

The water-proofing of concrete blocks is a question that is constantly bobbing up and there is never a convention or a gathering of even two or three concrete block manufacturers but what something is said upon the subject of water-proofing. Now just why this should remain at this late day such a problem is indeed astounding. The matter has been threshed over so many times in these columns that we hardly feel like imposing upon our readers further in this connection. There is no use for any manufacturer pretending that the cement mortar block manufactured of sand and cement and cured in the usual way of sprinkling or dampening once or twice a day for two weeks is water-proof, for it is not. It is porous and for that reason, it will absorb a great deal of water when immersed, or when it is built into a wall a long continued and driving rain will cause them to show damp spots on the inside of the wall.

In looking for a remedy for this condition, the first requisite is to find the cause and next how to remove that cause; the cause being removed, the trouble naturally disappears. There is but one cause for the absorption of cement mortar block and that is their porosity. This can be overcome to a great extent by mixing with the cement before it is put into the concrete mixer from 8 to 10 per cent of high calcium hydrated lime. When the hydrated lime is thoroughly mixed with the cement and then added to four times its volume of dry sand and gravel or stone screenings, thoroughly mixed again before the water is added and then the block is cast just as wet as it is possible to mold it without the block falling down, a very large percentage of the porosity will be eliminated.

The curing of the block is the next step in its manufacture that requires attention. After the initial set, that is five or six hours after it is molded, it should be kept moist for several days and after that for several days longer, completely drenched with water, so as to satisfy all of the bonding element in the cement. The blocks should be then covered, if they are not piled under cover and allowed to season slowly, for hot, dry winds passing over the blocks have a tendency to evaporate the water faster than the crystallization of the cement particles can employ it. Some manufacturers have found great improvement in their product by immersing their blocks in tepid or warm water for a period of twenty-four hours the day after they are molded, and there are manufacturers who have equipped their plants with tunnels for the purpose of seasoning all the blocks which they manufacture by the use of wet, exhaust steam so as to force the complete crystallization of all the cement particles. After the blocks are well seasoned by any of these processes, in the course of several days they will be hard and dry like a true artificial stone, and will be much more impervious to moisture than if they were made of a composition of sand and cement alone and seasoned carelessly.

It is probable that blocks made in this way will not develop in any ordinary building sufficient

moisture absorption to be objectionable. There are a number of water-proofing compounds on the market that can be had at low cost which will completely eliminate the moisture absorption difficulty when properly used. All of them are simple of composition and easy to use. There is really no further reason for the manufacturer of concrete blocks to have the slightest annoyance with regard to the absorption of his blocks, for it is a simple matter that can be remedied at any time. What is far more important is to attend more carefully to the mixture from which the blocks are molded and to follow the process or seasoning so that all of the cement is brought into action before the blocks are considered finished and ready to be placed in the wall.

Concrete Design Competition.

The Association of American Portland Cement Manufacturers has issued a program of a prize competition for designs of suburban dwellings in concrete. The designs are to be in two classes, Class "A" single or detached dwellings, Class "B" twin or semi-detached buildings. Each plan must show the design of all the stories above the cellar, three elevations and a section, all drawn at the scale of $\frac{1}{4}$ inch a foot. There will be eighteen prizes in all, ranging from \$200.00 for the highest to \$40.00 for the lowest, besides \$25.00 each to those whose designs are awarded honorable mention. The secretary of the American Portland Cement Manufacturers' Association will be glad to furnish copies of this program to those who may apply for them. His office is located in the Land Title Building, Philadelphia, Pa.

Concrete Automobile Road.

A bill has been presented to the Indiana Legislature which provides that concrete railroads may enjoy the same privilege in that state as do steam and electric railroads. L. T. Sweeney, of Columbus, Ind., proposes to build a concrete automobile railroad from Seymour to Brownstown, a distance of ten miles, and install a number of automobiles for the accommodation of passengers. The road bed is to be constructed so as to make it almost impossible for a car to jump the track. The design consists of a concrete road-bed in the center of which is a rail of concrete, about one foot high and one foot wide, extending the full length of the line, except at grade crossings when it will be left off. Automobile cars which will seat from fifty to sixty persons will be constructed with wheels to run on each side of the concrete rail. The proposed road is an experimental line and should it prove successful, other lines will be built later on. It is claimed that the cost of construction would be less than 50 per cent of steam or electric roads while the repair bills on such a railroad would be trivial as compared with the maintenance of a right of way where cross-ties, ballast and steel rails have to be constantly replaced.

Concrete Railway Bumpers.

The Lackawanna Railroad has adopted for use in freight yards a standard concrete bumping post that is giving more satisfaction than any of the bumpers that heretofore have been tried by the company on freight storage tracks. These bumpers are of almost solid concrete construction and are fitted with a granite block having a face of 12 by 14 inches, set ten inches into the concrete at a height of nine inches from the top of the mass or in proper position to receive the blows from the buffer of the car. The rails of the roadbed project into and are imbedded into the concrete, which is carried to a solid foundation, so that the tendency of the forces resulting from the impact of the car would be to raise the track with the weight of the car on it. The energy therefore would be largely overcome in the case of a severe shock by the weight of the car itself.

Perfection Cement Stone Co.

OMAHA, NEB., February 20.—C. F. McCreary, of the Perfection Cement Stone Co., is looking forward to a big spring business. He operates with a Perfection power block machine outfit and has been turning out a high grade of block. At the present time his yard is stocked with about 5,000 blocks of various sizes ready for the spring trade. Mr. McCreary is highly pleased with the Perfection machine and has been able to break records in the way of quality and quantity.

Another Consolidation.

On account of the great demand for high grade concrete block machinery, and, desiring to manufacture at a point where shipping facilities and labor conditions are excellent, also to be connected with one of the oldest, largest and most responsible concerns, the Hoosier Manufacturing Co., of Auburn, Ind.; the Concrete Block Machine Co., of Auburn, Ind.; the Normandin Machine Co., of Jackson, Mich., have all joined hands and consolidated their interests with the well known concrete machinery manufacturers, the Cement Machinery Co., of Jackson, Mich., which name will style the above consolidation in the future, with factories and office at Jackson.

The Cement Machinery Co. state that they will now control one of the largest, best and most exclusive lines of concrete machinery in the world, namely: The Hoosier, Peninsular and Champion face down block machines, the Normandin, Model and Cemaco side face block machines, the Favorite mechanical tamping cement brick machines, the Practical adjustable sill cap and step mold, the Universal cement post machines, concrete mixers, cement sewer pipe molds, ornamental ball, base baluster and column molds, cement shingle machines, cement roofing tile machines, etc.

This company will now make a specialty of installing complete concrete product plants throughout the United States and foreign countries.

The officers are William F. Cowham, president and general manager; Sid. L. Wiltse, secretary and manager of sales; John W. Boardman, Jr., treasurer and manager of finance, and Willis H. McDowell, general superintendent.

Eugene McDowell, Wheeler McDowell, John W. Miller and P. C. Green are also connected with the company in important departments.

The company's motto is "honest, practical machines that 'do things' sold on a 'live and let live' basis."

Busy in California.

P. S. Bertholet, Winter, California, writes, "I have just completed two nice buildings with blocks made on the Hercules machine. One is the U. S. post office, 39 by 25 feet, and the other is a printing office for the *Winter Express*, 39 by 25 feet. I recently completed a fine store building for the Baker Hardware Co., 37½ by 71 feet in size. I also laid cement side-walks, ten feet wide around all of these buildings and the owners have expressed entire satisfaction with all the work. There is certainly a good outlook for the concrete building trade in this locality."

Concrete Telegraph Poles.

G. A. Celler, superintendent of telegraph of the Pennsylvania Lines, west of Pittsburg, and D. R. Davis, superintendent of construction of the Western Union, both of Pittsburg, Pa., recently superintended a test of a re-inforced concrete telegraph pole made at Rochester, Pa. The advancing cost on account of the scarcity of supply of wooden poles makes it necessary to find a substitute promptly. It is said that the poles tested were about the height and thickness of the wooden pole and from every standpoint the test was entirely satisfactory as a progress test. Before placing any orders for these re-inforced concrete telegraph poles, a careful estimate of the cost will be made and compared with the bids presented by the timber people who have furnished telegraph poles in the past.

A New Process.

The Bovee Grinder and Furnace Co., of Waterloo, Ia., is manufacturing a machine which varies somewhat from the ordinary concrete system. This concern makes a set of forms that can be used in erecting concrete or re-inforced concrete buildings and no veneer is necessary. The forms are set up and the concrete flushed into the space. After a couple of hours the forms can be moved up and the result is finished solid concrete structure with no air spaces or joints. A cut of a building built by this process is shown herewith.

Recent Incorporations.

The Waycross Artificial Stone and Tile Co. has been formed at Waycross, Ga., for the manufacture of artificial stone, tiling and cement brick.

The Ward Concrete Stone Co., of Watertown, N. Y., has been incorporated with a capital stock of \$20,000.00 by T. J. P. A. and J. F. Ward to manufacture concrete blocks.

The Jamaica Brick and Concrete Construction Co., of Queens Borough, New York, has been incorporated with a capital stock of \$5,000.00 by Philip Grass, W. A. Smith, and E. R. Clark.

The Wilmington Granite Block Co., of Wilmington, N. C., has been incorporated with a capital stock of \$100,000.00 by G. W. Kidder, F. H. Smith, and Thomas H. Wright. They will deal in concrete blocks.

The New England Roman Stone Co., of Wilmington, Del., has been incorporated with a capital stock of \$10,000.00 by A. H. Smith, Rutland, Vt.; R. H. Gillet and W. C. Colburn, of Troy.

The Philadelphia Hydraulic Stone Co., of 205 Market Street, Camden, N. J., has been incorporated with a capital stock of \$150,000.00 by Emory S. Bortel, 1801 Market Street; Granville N. Busby, 4052 Aspen Street, both of Philadelphia; and Frank L. Hollinshead, of Camden, N. J.

The Maine Artificial Stone Co., of Portland, Me., has been incorporated with a capital stock of \$10,000.00 by R. H., A. W. and R. D. Higgins, all of Portland.



HOUSE BUILT BY BOVEE GRINDER AND FURNACE CO.'S SYSTEM.

The Maine Concrete Co., of Bangor, Me., has been incorporated with a capital stock of \$50,000.00 by I. K. Stetson and V. Brett.

The Walt-McClellan Brooklyn Cement Stone Co., of Brooklyn, N. Y., has been incorporated with a capital stock of \$10,000.00 by James Walt, Joseph McClellan, Sr., and Joseph McClellan, Jr.

The Brillsford Artificial Stone and Tile Co., of Wilkes-Barre, Pa., has been incorporated with a capital stock of \$100,000.00.

The Ideal Cement Block Manufacturing Construction Co., of Newark, N. J., has been incorporated by A. Connelly, A. K. Connelly and F. W. Koeger.

The Jersey Architectural Stone Co., of Jersey City, N. J., has been incorporated with a capital stock of \$75,000.00 by A. H. Bromley, Jr., A. D. Hughes and C. J. Kirshtein.

The Rock River Concrete Construction Co., of Rock River, Ill., has been incorporated with a capital stock of \$25,000.00 by Lambertus Warmolts, L. L. Dewar and William Irwin.

The Dutch Cement Block Co., of Brooklyn, N. Y., has been incorporated with a capital stock of \$5,000.00 by R. R. Dutcher, A. D. Mapledoram and W. L. Johnson.

Notes of the Trade.

John Leach, of Carthage, Mo., who began the manufacture of cement brick last summer, says that the demand far exceeds the supply and that although he is turning out 5,000 brick a day he is far behind on his orders.

The Allegheny Facing Brick and Concrete Co., capitalized at \$40,000.00, has begun the construction of a plant near Wellesville, N. Y.

At the annual meeting of the Concrete Stone and Sand Co., of Youngstown, O., the following directors were named: E. S. Walton, J. D. Gibson, A. H. Buehrle, A. A. Pauley and Richard Garlick.

Fred L. Metcalf, of Highland, N. Y., has established a plant for the manufacture of concrete building blocks, concrete side-walk blocks, and concrete tile and brick.

At the annual meeting of the Elmira Cement Products Co., of Elmira, N. Y., the following officers were elected: Thomas Milan, president; Charles A. Pulford, vice-president; and Harry A. Fisk, secretary and treasurer. Reports showed that the industry has grown rapidly.

W. P. Mincker, of Franklinton, La., has purchased machinery for the manufacture of concrete blocks.

Larner & Smith, of Staunton, Va., have been awarded the contract for the erection of two six room cottages of Palmer concrete blocks.

The Racine Hollow Concrete Wall Co., of Racine, Wis., has increased its capital stock from \$9,000.00 to \$10,000.00 and elected the following directors: W. H. Lingsweller, Henry Hoernel, A. B. Augustine, Alex. Horlick and Fulton Thompson.

The Ideal Building Stone Co., has located a plant at Norfolk, Va., for the manufacture of concrete blocks. J. C. Byars, of Bristol, Va., is president of the company, and W. T. Tillar, of Emporia, Va., is vice president.

The Winston-Salem Concrete and Stone Co., of Winston, N. C., has elected Edward Ragland president and J. J. Roddick, secretary.

T. R. Casey, of Hutchison, Kan., has installed machinery for the manufacture of concrete blocks.

Lee Scott, of Ripley, Tenn., is establishing a new concrete building block plant at Nashville, Tenn.

J. H. Long has built a plant at Orwingsburg, Pa., for the manufacture of concrete blocks, window sills, lintels, etc.

The Faragher Engineering Co., of Cleveland, O., has been awarded the contract for the construction of a five-million gallon water storage reservoir of re-inforced concrete at Asheville, N. C.

The Brown Concrete Stone Co.

FT. SMITH, ARK., February 18.—The Brown Concrete Stone Co. has a complete plant at 718 Wheeler Avenue. They started at this location last March and considering the length of time that they have been in business they have accomplished a great deal especially as building stone is not so expensive. At the present time they are operating a Miles concrete block machine but expect to install two or three more machines this spring. They have been turning out a high grade concrete block, using Joplin flint and Carthage crushed lime stone as an aggregate, with a fine quality of sand secured from the Arkansas river near by. During the past season this company has built several residences and store rooms. They also recently completed the Lexington Avenue Baptist Church which is a handsome structure. They have contracts to build several store houses and residences this spring. An addition to their shed will be built and some cars purchased for the better handling of the blocks.

Successful Atchison Operators.

ATCHISON, KAN., February 18.—Kaas & Braun are among the most successful concrete operators here. They have a well equipped plant at 1021 Laramie Street. Mr. Kaas, who is the manager of the business, is a general contractor. He learned his profession in Germany and practiced it in several other foreign countries before coming to America. He thoroughly understands his business and has been a contractor and builder for the last twenty-two years. At present he is operating a Miracle machine but makes a specialty of porch columns and window sills. His porch column mold is his own invention, and he has had remarkable success with it. He expects to make molds to sell to concrete manufacturers throughout the country. Mr. Kaas has built several handsome residences on which he used a veneer block.

Forms for Concrete Construction.

BY SANFORD E. THOMPSON, M. AM. SOC. C. E.

(Paper read before the Third Annual Convention of the National Association of Cement Users, Chicago, Ill., January 7 12.)

Recent failures in re-inforced concrete construction can not be cast to one side and forgotten with the passing comment so frequently heard that the accident was due merely to poor construction or too early removal of forms. The reasons for every failure should be thoroughly investigated by experts to prevent re-occurrence of similar accidents.

"Poor construction" and "forms," although frequently guilty, are by no means the only culprits. Just so long as men who know nothing of the first principles of mechanics are permitted to design concrete structures, and just so long as irresponsible contractors are engaged to erect them, the list of accidents will increase in startling numbers. It is the men, not the inanimate lumber, who are to blame in every case. However, granting its danger under ignorant hands, re-inforced concrete as a whole must not be condemned for failures due to improper conditions any more than brick should be rejected as a building material for apartment houses because of the fall of several unfinished buildings, such as occurred in New York City two years ago through disregard of frost action upon the mortar.

Failures in concrete buildings may be attributed to:

- (1) Imperfect design; especially through neglect of essential details in locating the reinforcing metal, and through the adoption of too low a factor of safety.
- (2) Poor materials; such as cement which does not properly set up, or sand which is too fine or which has an excess of clay, loam or other impurities.
- (3) Faulty construction; from improper pro-

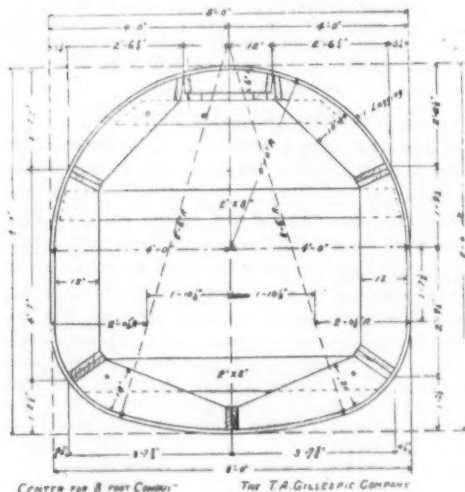


FIGURE 1.

portioning, mixing or placing, or too early removal of forms.

- (4) Weak forms.

A disregard of such important principles is frequently criminal negligence, and yet in at least one case under my observation, an examination of the structure and the materials after a collapse in which a number of lives were lost showed both the design, materials and construction so faulty that it was impossible to decide positively which of the four elements named was the primary cause of the failure.

In this paper it is proposed to treat only of the design, construction and removal of forms.

General Rules for Form Construction.

Kind of Lumber. The selection of the lumber must be governed by the character of the work and by the local market. White pine is best for fine face work, and quite essential for ornamental construction cast in wooden forms. For ordinary work, however, even for the panels, white pine is apt to be too expensive, and spruce, fir, Norway pine or the softer qualities of Southern pine, especially North Carolina pine, must be substituted for it. Some of these woods are more liable to

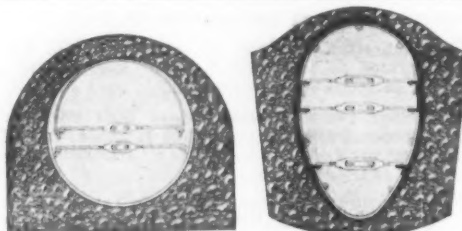


FIGURE 2.

warp than white pine, but they are generally stiffer and thus better adapted for struts and braces.

Kiln dried lumber is not suitable for form construction because of its tendency to swell when the wet concrete touches it. Very green lumber, on the other hand, especially southern pine which does not close up quickly when wet, may give trouble by joints opening. Therefore, the middle ground, or in other words, partially dry stuff is usually best.

Finish and Thickness of Lumber. Either tongued-and-grooved or bevel edged stuff will give good results for floor and wall panel forms, and is preferable to square edged stuff. A smoother surface may be attained at first with the tongued-and-grooved stock and there is less trouble with opening joints, but it is more expensive because of the waste in dressing, and if the forms are used many times, there is greater tendency to wear at the joints. Even for rough forms plank planed one side may be economical to cheapen the cost of cleaning. Studs should always be planed one side to bring to size.

The thickness of lumber varies with different contractors, some using 1 inch, others 1½ inch, while a few employ 2 inch stuff even for panels. (These are commercial thicknesses measured before planing.) For ordinary walls 1½ inch stuff is good, although for heavy construction where derricks are used 2 inch is preferable. For floor panels 1 inch boards are most common, although if the building is eight stories high or over, 1 inch stuff is likely to be pretty well worn out before the top of the building is reached and the under surface of the concrete will show the wear badly. For sides and girders either 1 inch or 1½ inch is sufficient, while 2 inch is preferable for the bottoms of girders. Column forms are generally made of 2 inch plank.

Details of Form Construction.

Certain general rules are applicable to all kinds of forms. Strength, simplicity and symmetry are three fundamental principles of design. The necessity for strength is obvious. Economy in concrete construction consists in quickly erecting and moving the forms and in using them over and over again.

The design of the concrete members should recognize the forms. A slight excess of concrete sometimes may be contributed to save carpenter work. Frequently beams may be designed of such widths as to use dimension sizes of lumber without splitting. Columns may be of dimensions to avoid frequent re-making. Recesses may be made the thickness of a board or a plank. To permit ready cleaning of dirt and chips from the column forms before laying the concrete, at least one prominent contractor provides a door at the bottom of each of them.

In building construction the forms must be designed so that the column forms and also the bottom of beam forms are all independent of the slab

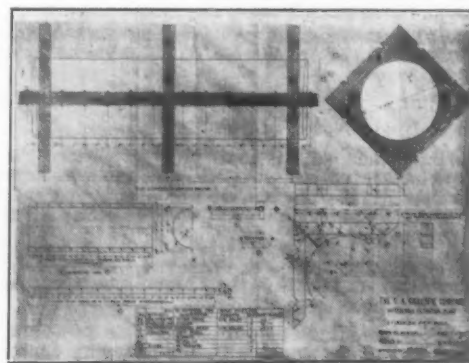


FIGURE 3.

form. The forms may thus be left a longer time upon members subjected to the greater stress.

The sides of the beam forms should be held tightly together by wedges or clamps, to prevent the pressure of the concrete springing them away from the bottom boards. Hard wood wedges at top or bottom of each strut are useful when setting and removing it and also permit testing to make sure that there is no deflection of the beam or slab. For this purpose some contractors loosen the wedges twenty-four hours in advance of the struts. In general it is preferable to use comparatively light joists, such as 2x8 or 2x10 inches, with frequent shores rather than to use lumber which is heavier to handle.

If forms are to be used but once or must be taken apart when removed, it is sometimes practicable to use only a few partially driven nails so that they can be withdrawn without injury to the lumber. It is very difficult to convince house carpenters that the pressure of the concrete will hold temporary panel boards in place with scarcely any nailing.

Alignment is another item of importance since it is here that a great deal of time may be wasted by inexperienced or incompetent carpenters. Such workmen may err either on the side of poor alignment or more careful alignment than the structure requires. It has been suggested as a general rule the allowance of ¾ inch departure

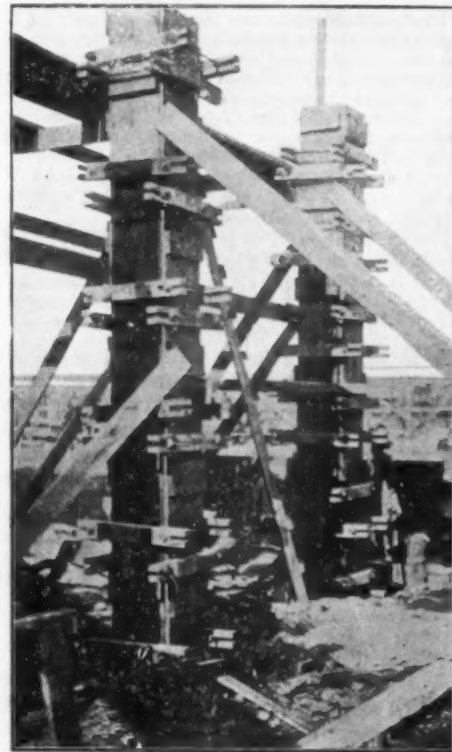


FIGURE 4.

from established lines on finished work and 2 inches on unfinished work.

In removing forms the green concrete must not be disturbed by prying against it. This seems so obvious as to need no emphasis, but I have known first class carpenters to actually attempt to straighten a wall which was an inch out of line the day after the concrete was laid by prying the forms over. The wall was straightened, but by a different process from that proposed by the carpenter, the concrete was relaid.

Forms for facework should be tightly put together, it being advisable in some cases to close the joints and holes by mortar, putty, plaster-of-paris, sheathing paper or thin metal. This is not, as is commonly supposed, to prevent loss of strength by the cement which flows out with the water, but rather to prevent the formation of voids or stone pockets in the finished surface.

Crude oil is one of the best materials to prevent adhesion of the concrete to the forms, though linseed oil, soft soap and various other greasy substances are also employed for this purpose. The oil or grease should be thin enough to flow and fill the grain of the wood.

If the forms are to be left on until the concrete is hard, there is little danger of the concrete stick-

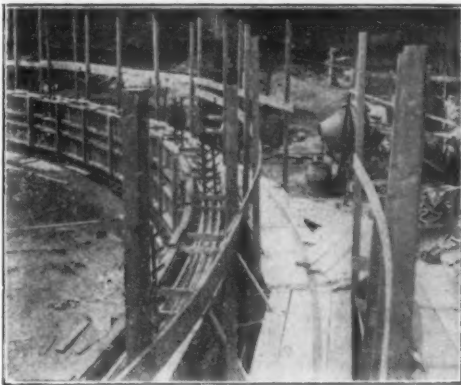


FIGURE 5.

ing to them if they are wet thoroughly with water before the concrete is laid, instead of being greased. In any case, if concrete adheres to the forms it should be thoroughly cleaned off before resetting; even then it is apt to stick again in the same place.

Design of Forms.

"Rule of thumb" layout of forms in the field is being superseded by design in the drawing room. In building construction where the forms constitute a large percentage of the cost of the building and where a failure in the forms may cause loss of life, it is especially necessary to treat this question from an engineering standpoint, and many of the best concrete contractors now design their forms as carefully as the dimensions of the concrete members.

If a minimum quantity of lumber is to be used consistent with the deformation allowed, it follows that the dimensions and spacing of the supporting lumber must be actually computed from the weight or pressure against the sheeting. For columns and for walls where a considerable height of wet concrete is to be placed at once the pressure may be calculated as a liquid. It is assumed that the concrete is a liquid of half its own weight or 75 pounds per cubic foot.

In ordinary walls where the concrete is placed in layers computation is not usually necessary, since general experience has shown that maximum spacing for 1 inch boards is 2 feet, for 1½ inch plank is 4 feet, and for 2-inch plank is 5 feet. Studding generally varies from 2x4 to 4x6 inch, according to the character of the work and the distance between the horizontal braces or walling.

Floor forms are better based upon an allowable deflection than upon strength, in order to give sufficient stiffness to prevent partial rupture of the concrete or sagging beams.

In calculating we must add to the weight of the concrete itself, i. e., to the dead load, a construction live load which may be assumed as liable to come upon the concrete while setting. Definite units of stress must also be assumed in the lumber.

I would suggest the following basis for computation, these being values which I have adopted after quite thorough consideration of the matter:

- (1) Weight of concrete including reinforcement 154 lbs. per cu. ft.
- (2) Live load 75 lbs. per sq. ft. upon each slab; 50 lbs. per sq. ft. in figuring beam and girder forms.
- (3) For allowable compression in struts use 600 to 1,200 lb. per sq. in., varying with the ratio of the size of the strut to its length. (See table below.) If timber beams are calculated for

strength, use 750 lb. per sq. in. extreme transverse fiber stress.

(4) Compute plank joists and timber beams by the following formula, allowing a maximum deflection of 1/8 inch.

$$d = \frac{3}{384} \frac{Wl^3}{EI} \quad (1)$$

$$\text{and } I = \frac{bh^3}{12} \quad (2)$$

In which

- d - Greatest deflection in inches
- W - Total load on plank or joist
- l - Distance between supports in inches
- E - Modulus of elasticity of lumber used
- I - Moment of inertia of cross-section of plank or joist
- b - breadth of lumber
- h - depth of lumber

The formula is the ordinary formula for calculating deflection except that the co-efficient is taken as an approximate mean between 3/384 for a beam with fixed ends and 3/256 for a beam with ends simply supported.

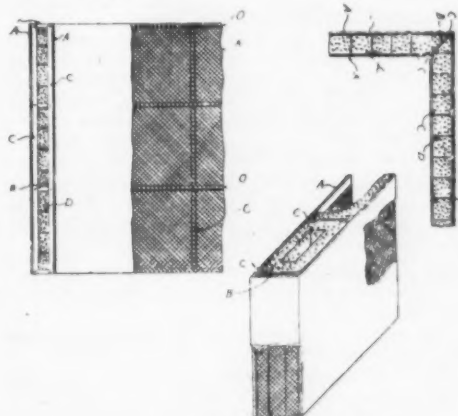


FIGURE 11.

For spruce lumber and other woods commonly used in form construction, E may be assumed as 1,300,000 lbs. per sq. in.

Formula (1) may be solved for I, from which the size of joist required may be readily estimated.

The weight of concrete per cubic foot is some what higher than is frequently used, but is none too much where a dense mixture and an ordinary per centage of steel is used. For very rough calculation, however, it is frequently convenient to remember that 144 lbs. per cubic foot is equivalent to the products of the dimensions of a beam in inches times a length of one foot.

The suggested live load is assumed to include the weight of men and barrows filled with concrete and structural material which may be piled upon the floor, not including, however, the weight of piles of cement or sand or stone, which should never be allowed upon a floor unless its weight is supported by concrete sufficiently strong to bear the weight or by struts under all the floors below.

The units for stress in struts are somewhat higher than in timber construction because the load is a temporary one. The extreme variation is due to the fact that when a column or strut is longer than about sixteen times its smallest width,

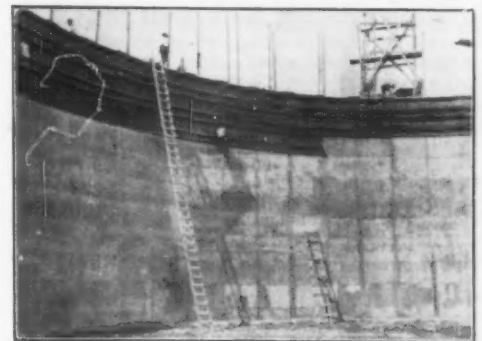


FIGURE 6.

there is a tendency to bend which must be prevented either by bracing it both ways or allowing a smaller load per square inch. For struts ordinarily used the following stresses may be assumed for different heights:

SAFE STRENGTH OF WOOD STRUTS IN FORMS FOR FLOOR CONSTRUCTION.

Length of Strut, Feet	Pounds per sq. in. of Cross-Section			
	3 in. x 4 in. Strut	4 in. x 4 in. Strut	6 in. x 6 in. Strut	8 in. x 8 in. Strut
14	600	700	900	1,100
12	600	800	1,000	1,200
10	700	900	1,100	1,200
8	850	1,050	1,200	1,200
6	1,000	1,200	1,200	1,200

Bracing both ways will of course reduce the length of a long strut. If the concrete floor is comparatively green, the load must be distributed by blocking, preferably of hard wood. At the top of the strut provision must be made against crushing of the wood of the plank or cross-piece. Ordinary soft wood will stand only about 700 lbs. per sq. in. across the grain so if the compression approaches this figure, brackets must be inserted or hardwood cleats used.

Time to Move After Placing.

The best contractors have definite rules for the minimum time which the forms must be left in ordinary weather, and then these times are lengthened for changes in conditions according to the judgment of the foreman.

Correspondence with a number of prominent contractors in various parts of the country, including the Aberthaw Construction Co., (Boston), the Expanded Metal and Corrugated Bar Co., (St. Louis), the Ferro Concrete Construction Co., (Cincinnati), the Trussed Concrete Steel Co., (Detroit), and the Turner Construction Co., (New York), indicate substantial agreement in the minimum time to leave forms. As a guide to practice, the following rules are suggested, these following in the main requirements of the Aberthaw Construction Co.:

Walls in mass work: One to three days, or until the concrete will bear pressure of the thumb without indentation.

Thin walls: In summer, two days; in cold weather, five days.

Slabs up to 6 feet span: In summer, six days; in cold weather, two weeks.

Beams and girders and long span slabs: In summer, ten days or two weeks; in cold weather, three weeks to one month. If shores are left without disturbing them, the time of removal of the sheeting in summer may be reduced to one week.

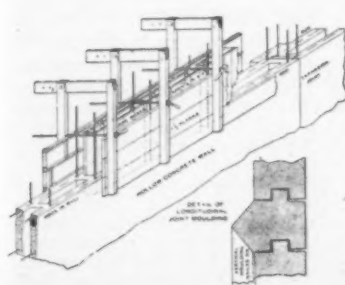


FIGURE 10.*

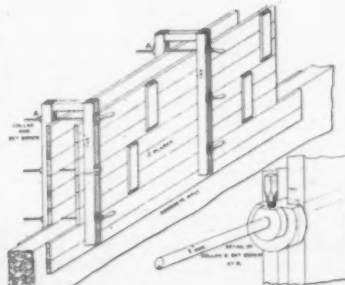


FIGURE 9.*

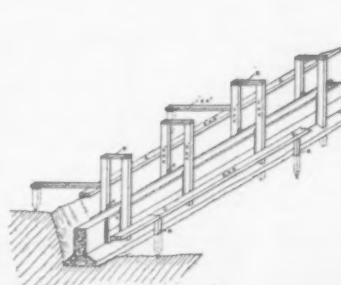


FIGURE 8.*

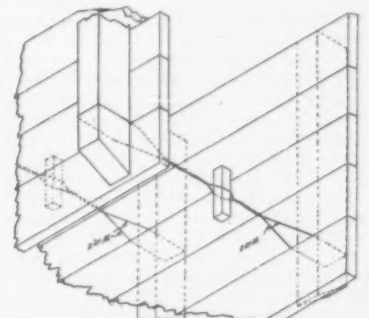


FIGURE 7.*

Column forms: In summer, two days; in cold weather, four days, provided girders are shoved to prevent appreciable weight reaching columns.

Conduits: Two or three days, provided there is not a heavy fill upon them.

Arches: Of small size, one week; for large arches with heavy dead load, one month.

All of these times are of course simply approximate, the exact time varying with the temperature and moisture of the air, and the character of the construction. Even in summer during a damp cloudy period, wall forms sometimes can not be removed inside of five days with other members in proportion. Occasionally too, batches of concrete will set abnormally slow either because of slow setting cement or impurities in the sand, and the foreman and inspector must watch very carefully to see that the forms are not removed too soon. Trial with a pick may assist in reaching a decision.

Beams and arches of long span must be supported for a longer time than short spans because the dead load is proportionately large, and therefore the compression in the concrete is large even before the live load comes upon it.

The general uncertainty and the personal element which enter into this item emphasizes the necessity for some more definite plan for insuring safety. The suggestion has been made that two or three times a day a sample of concrete be taken from the mixer and allowed to set on the ground under the same conditions as the construction until the date when the forms should be moved. These sample specimens may be put in a testing machine to determine whether the actual strength of the concrete is sufficient to carry the dead and construction loads. Even this plan does not provide for the possibility of an occasional poor batch of concrete so

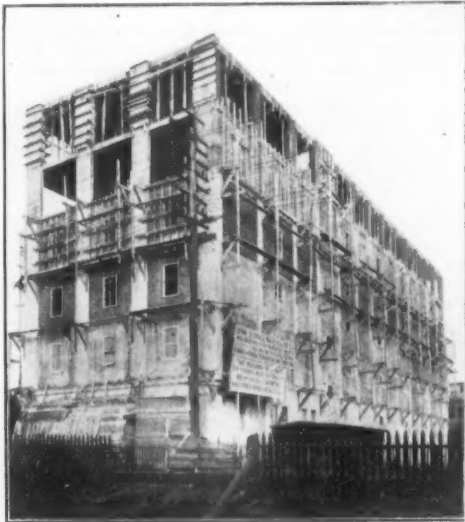


FIGURE 14.

that watchfulness and good judgment must also be exercised.

Examples of Form Design.

I have selected a number of illustrations of typical modern form construction.

The centers for an 8 foot conduit used by the T. A. Gillespie Co. in the Pittsburg filtration system are shown in Fig. 1. You will notice that the form is built in sections bolted together so as to be easily taken apart.

The patented Blaw centering is illustrated in Fig. 2. The shell is of steel with turnbuckles provided to collapse the metal, as shown in the right-hand half of the figure.

In the Pittsburg filter galleries a very large number of columns were erected for supporting the groined arch roof. Many of those columns were molded in steel centering shown in Fig. 3, this being economical because of the large number of times which it could be used over and over.

A more common style of column forms is that employed in the erection of the Harvard Stadium, as shown in Fig. 4. The slotted form of clamp does not give such stiff centering as another type which I will show later in connection with building forms.

In Waltham, Mass., a concrete reservoir or stand-pipe 100 ft. in diameter by 42 ft. high has recent-

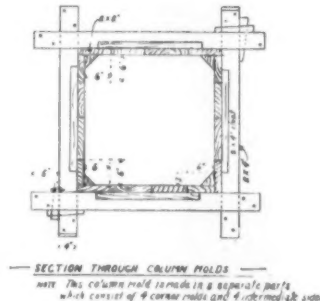
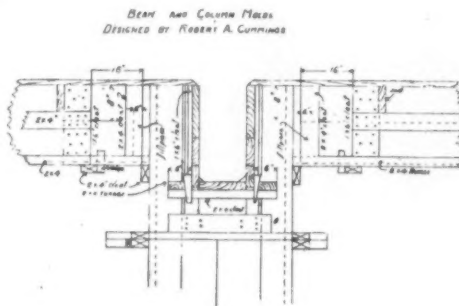


FIGURE 12.

ly been constructed under the direction of Mr. Bertram Brewer, city engineer. The forms, designed by the contractors, Simpson Brothers Corporation, are shown in Figs. 5 and 6.

Fig. 7 illustrates the construction of a heavy wall where the ties consist of wire twisted to hold the sides in place.

A simple form of construction for a low foundation wall is given in Fig. 8.

Fig. 9 illustrates a common form for building a wall of greater height. As soon as a section is completed, the bolts are loosened, and the slotted form of clamp or brace permits it to be readily moved upward. This slotted construction was designed by Mr. E. L. Ransome, one of our pioneers in concrete construction.

Forms for hollow walls are shown in Fig. 10.

A style of wall construction has been designed, and patent applied for by Mr. S. H. Lea, using metal lathing which has first been plastered on the outside for the forms. (See Fig. 11.)

Beam and column forms such as are used in ordinary building construction are shown in Fig. 12. This is a common type with certain features designed by Mr. Robert A. Cummings, from whose drawings the photograph has been made. To hold the sides of the beam forms against the bottom board Mr. Cummings uses a 2x4 inch runner with wedges against it. The column form shown in the same figure is provided with wedges which permit very firm and solid construction.

A clamp which is much used by the Ferro-Concrete Construction Co., of Cincinnati is shown in Fig. 13.

A somewhat different type of beam and slab forms has been designed by Mr. Benjamin Fox. The forms for each panel are made in two sections and supported at the center so that they may be dropped without disturbing the bottom plank of the beams and girders. The beams and girders are stiffened by 6x8 inch and 8x8 inch timbers placed underneath them and supported by posts varying in size from 4x4 to 8x8 inches, according to the load to be carried.

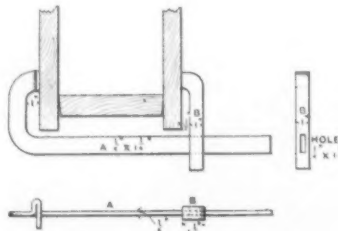


FIGURE 13.*

Wall panels in a concrete building are most cheaply constructed after the columns are built. Practical methods as adopted by the Eastern Expanded Metal Co., of Boston, are shown in Fig. 14. It also shows quite clearly the other portions of the form construction.

Fig. 15 is a photograph of the pouring of a slab in a sand mold at the Harvard Stadium by methods adopted by the builders, the Aberthaw Construction Co.

(*Reproduced by permission from Taylor & Thompson's "Concrete, Plain and Reinforced").

Will Remodel Their Plant.

FORT DODGE, IA., February 12.—The Iowa Hydraulic Stone Co. will remodel their plant, installing a washing screen a batch mixer and a large gasoline engine. H. W. Wolfe, the manager, says that they expect to build a number of houses outside of the city next season and will double their local business, as the architects are now specifying their blocks. All their work is made on a Normandin machine and about fifteen men are required to operate the plant.

Built Their Own Mixer.

MASSILLON, O., February 10.—The Massillon Cement Stone Co. has one of the most compact, as well as convenient plants in the country. They are turning out a good block and using a mixer planned and built by F. F. Flickinger, manager. This mixer is on the cylinder order about five feet long and three feet in diameter; several paddles are attached to the interior which throw the batch in all directions in the course of mixing. The blocks are steam cured and are giving satisfaction. Alpha cement is used exclusively.

Working Through Winter.

BUFFALO, N. Y., February 5.—The H. & B. Concrete Co. is continuing operations right through the winter, and the outlook for spring jobs is



FIGURE 15.*

good. Their latest contract is the addition to the plant of the Excelsior Steel Ball Co., which will be a hollow concrete block building 137 x 50 ft., with an L 40x90 feet. J. P. Maddigan is the architect.

New Concern in New Albany.

NEW ALBANY, IND., February 7.—The Johnson Concrete Construction Co., with a factory at 1828 East Oak Street, for the manufacture of concrete blocks, is one of the new industries of this city. The company has just installed a complete outfit of modern mixers, block machines, etc., and is preparing for the busy season of 1907.

Warner & Co., a new concern for the manufacture of concrete blocks, has been capitalized at \$10,000.00 at New Orleans, La. The officers are: James E. Warner, president and treasurer; E. E. Kirkhorn, vice president and treasurer.

Tests of Concrete Blocks.

BY R. D. KNEALE, INSTRUCTOR IN CIVIL ENGINEERING,
PURDUE UNIVERSITY.

This paper is a description of the tests of some thirty plain concrete building blocks which were about one year old. These blocks were of the usual block type, 16x8x6 inches, with two 4x5 inch inside openings. All were made of the same materials and treated as nearly alike in manufacture as possible. The materials used were gravel 100 per cent fine on a sieve of one-half inch mesh, and Lehigh Portland cement. The proportions were 1 of cement to 5 of gravel. Each block was faced with 1:2 mortar, using the same cement as in the body of the block, and using an ungraded, clean river sand. The faces were so well bonded to the block that in no case did failure occur between facing and block. The faces were approximately one-half inch thick, and were not considered in figuring the cross section used in compression tests. After initial curing the blocks were stored outdoors without covering. They were selected at random for the test from large piles exhibited for sale.

Mr. B. K. Kramer, the manufacturer, states that with more skillful grading of materials he is able to secure much greater density.

The blocks were tested in the laboratory for testing materials at Purdue University. The results of the tests are as follows:

Six blocks were broken in flexure. Two 1 inch wrought iron rollers were placed 14 inches apart on the platform of a Riehle 200,000 pound vertical testing machine. On these rollers the block was placed, with the facing vertical. A third roller 1 inch in diameter, was placed parallel to the others on the center line of the block, and the compression head brought down on this roller. The results given below show fair uniformity:

No.	Span, inches.	Load at Failure, pounds.	Modulus of Rupture, (lbs. per sq. in.)
1	14	6,040	300
2	14	5,270	260
3	14	4,900	242
4	14	3,900	192
5	14	4,300	212
6	14	4,880	240
Average, 4,485			241

Twenty-four blocks were tested in compression—six in columns one block high, two columns two blocks high, two columns three blocks high and two columns four blocks high. To give an even bearing on the machine, the columns were bedded in plaster, and to give an even bearing on each other in the column one series of blocks was cemented into columns with plaster, the other series with neat Portland cement. This difference of bedding material, however, gave no appreciable variation in results. All columns failed in similar vertical planes through the partition walls. The results of the compression test are as follows, the 200,000 pound Riehle vertical testing machine being used:

No. of Test.	No. of Columns Tested.	No. of Blocks in Column.	LOADS IN 1,000 POUNDS.											
			First Crack.						Maximum.					
			Total			Lbs. per Sq. In.			Total.			Lbs. per Sq. In.		
			Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
1	1	1	195	106	146	2.19	1.15	1.63	195	107	152	2.19	1.17	1.68
2	2	2	145	106	126	1.63	1.22	1.43	145	115	130	1.63	1.32	1.47
3	3	3	145	100	123	1.63	1.15	1.69	163	115	139	1.63	1.20	1.41
4	4	4	146	119	133	1.63	1.36	1.49	146	119	132	1.63	1.36	1.49

Weight.

The average weight per block was 55 pounds. The average weight per cubic foot of material was 147 pounds.

Absorption.

Half blocks after drying two days in the heating oven, were immersed in water and absorbed 6½ per cent by weight after four hours' immersion. After four days immersion this per cent of absorption increased only ½ per cent. On immersing the face only, it absorbed 2.3 per cent of the weight immersed in four hours.

Summary.

The results of the test then show that the modulus of rupture is 241 pounds per square inch, which is 85 per cent of that determined by Fuller

for 1:3:5 concrete beams. The strength per square inch in compression averages 1,500 pounds, or about 60 per cent of the strength of solid cubes and cylinders of 1:3:5 concrete as given by various authors. This compressive strength shows little variation for columns up to four blocks high.

Results throughout the test checked with fair uniformity.

The Treatment of Concrete Surfaces.

BY LINN WHITE, ENGINEER SOUTH PARK COMMISSIONERS, CHICAGO, ILL.

(Paper read before Third Annual Convention of the National Association of Cement Users, Chicago, Ill., January 7-12.)

A pleasing and consistent surface finish generally has but little to do with the strength of a concrete structure, but it is not inconsistent with maximum strength in any structure.

Next to form or design the character of the surface has most effect on the appearance of concrete whether in a building, arch, wall or abutment, in fact, when the view is had at a very close range, or in such structures as retaining walls or pavements the surface finish may take precedence over proportion.

It is not intended to attempt a full discussion of the subject, but only to describe some methods used in trying to obtain satisfactory surfaces in the various classes of concrete work done in the South Park System of Chicago.

The imperfections in the exposed surfaces of concrete are due mainly to a few well known causes which may be summed up as follows:

1. Imperfectly made forms.
2. Badly mixed concrete.
3. Carelessly placed concrete.
4. Efflorescence and discoloration of the surface after the forms are removed.

Forms with a perfectly smooth and even surface are difficult and expensive to secure. Made of wood as they usually are, it is not practical to secure boards of exact thickness, joints can not be made perfectly close, the omission of a nail here and there allows warping and the result is an unsightly blemish where least wanted.

Badly mixed concrete gives us irregularly colored, pitted and honeycombed surfaces with here a patch of smooth mortar and there a patch of broken stone exposed without sufficient mortar. Careless handling and placing will produce the same defects.

Results are not Satisfactory.

But granting we have the best of labor, that all reasonable expense and care is had in making up forms, in mixing, handling and placing the concrete, that it is well spaded, grouted, or the forms plastered on the surface, the results are not satisfactory. All these efforts tend to produce a smoothly mortared surface, and the smoother the surface, the more glaring become minor defects. The finer lines of closely made joints in the forms become prominent, the grain of the wood itself is reproduced in the mortar surface, hair cracks

are liable to form, and worst of all, efflorescence and discoloration are pretty sure to appear. We surely have been working on a wrong theory.

It is of doubtful efficiency to line the forms with sheet metal or oilcloth. Imperfections still appear.

Two methods suggest themselves as likely to overcome the defects alluded to above, (1) treating the surface in some manner after the forms are removed to correct the defects, and (2) using for surface finish a mixture which will not take the imprint of and which will minimize rather than exaggerate every imperfection in the forms and which will not effloresce.

Methods of treating the surface by bush hammering, tooling and scrubbing with wire brushes and water have been described in various pub-

lished articles, all of which have for their object the removal of the outer skin of mortar in which the various imperfections exist. But the method most used in the South Park work is the acid treatment. It consists of washing the surface with an acid preparation to remove the cement and expose the particles of stone and sand, then with an alkaline solution to remove all free acid, and finally giving it a thorough cleansing with water. The operation is simple and always effective. It can be done at any time after the forms are removed, immediately, or within a month or more. It requires no skilled labor, only judgment as to how far the acid or etching process should be carried. It has been applied with equal success to troweled surfaces, like pavements, to molded forms, such as steps, balusters, coping, flower vases, etc. and to concrete placed in forms in the usual way. It, of course, means that in the concrete facing only such material shall be used as will not be affected to the acid, such as sand or crushed granite. It excludes limestone.

Use of Colored Aggregates.

The treated surface can be made any desirable color by selection of colored aggregates or by the addition of mineral pigments. The colors obtained by selection of colored stone are perhaps the most agreeable and doubtless more durable.

There have been molded in the South Park shops blocks for buildings, columns, architectural moldings and ornaments with both red and black crushed granite, all treated with the acid to bring out the natural colors of the stone. There has been a large quantity of concrete pavement laid with torpedo sand surface colored a buff sandstone color with a small quantity of yellow ochre and mineral red and treated with acid. The buff color imparted to the surface is a welcome relief from the glare of the ordinary whitish gray concrete pavement in the sunshine, and the etching of the surface adds to the softness of the color at the same time preventing any slippiness. This same buff color has been used to a large extent in steps, bases of lamp posts, and other molded articles to be placed on or near the ground. With sand as the aggregate thousands of pieces have been molded for coping, balustrades, concrete seats, drinking fountains, pedestals, etc., which when treated with the acid appear like a fine grained almost white sandstone.

Where there are projections or marks left by the molds or forms they are tooled or rubbed down before treatment, and where it is necessary to plaster up rough places or cavities in the surface it may be done after treatment can not be detected.

These various classes of work have been done on a large scale during the last three years in connection with the improvement of new parks and has in all cases proved satisfactory.

The second method of preventing or minimizing surface defects has also been tried in the South Park work with quite a measure of success.

During the years 1904, 1905 and 1906 groups of concrete buildings have been erected in nine different parks costing with their accessories from \$65,000.00 to \$150,000.00 for each group. These buildings are all monolithic structures with occasional expansion joints, the exposed surfaces of walls being of a concrete composed of one part cement, three parts fine limestone screenings and three parts crushed limestone known as the ¼ inch size. This was thoroughly mixed quite dry so no mortar would flush to the surface and well rammed in wooden forms made in the usual manner. The result was an evenly grained, finely honeycombed surface, of a pleasing soft gray color, which grows darker with time and blends admirably with the park landscape. In placing it was not spaded next the form, it was too dry to cause any flushing of mortar so there is no smooth mortar surface, the imprint of joints between the boards hardly noticed and the grain of the wood not seen at all. There is no efflorescence apparent on the surface anywhere and can not be on account of the dryness of the mix and the porosity of the surface. The buildings are used as gymnasiums, assembly halls, reading and refreshment rooms, and as a rule the same gray concrete finish is given the interior wall as the exterior. In some cases a little color has been applied on the interior walls and the walls of shower and bath rooms have been water-proofed with plaster. The porosity of the surface makes it well adapted to receive and hold plaster.

This sort of surface is not capable of treatment with acid as a smoothly mortared surface, nor is it desirable. Consequently the only color obtain-

able is the natural color of the cement covered stone, but which is softer and far more agreeable than the gray of the usual mortar finished surface. It is not suited for the surface of a pavement and is not impervious to water. Although it is evident the water enters the pores to a considerable extent there is no evidence of injury from frost during the two winters some of these walls have stood.

The same finish has been used for retaining walls, arch bridges, fence posts, walls enclosing service yards, etc. In the buildings the thin walls were made entirely of this mixture while in the heavier structures it has been used only as a facing. Two re-inforced arches of 60 feet span were faced with this mixture, but the steel was imbedded in a wetter, more impervious concrete. This same dry mixture can be used for molded stones when the mold is open enough to permit tamping, and of course it is eminently suited to block machines.

Under Water Portion of Sea Wall.

The dry, rich mix with finely crushed stone has been found especially suited to another condition where a sound, smooth surface was particularly difficult to secure, viz: for the under water portion of a sea wall on Lake Michigan. It was mixed very dry and dumped in mass in sunken boxes joined end to end, made fairly water tight but from which the water was not excluded. With the finely crushed stone a sound smooth surface was obtained (when the sides of the boxes were removed) where it was manifestly impossible to plaster or grout the surface and where spading a mix of coarser stone simply washed the cement away from the surface stones. On account of the variable water level it was particularly desired to have a sound, smooth surface.

Of the work described, most of the monolithic buildings the arch bridges and some of the walls and paving have been done by contract. All of the molded work, the buildings made of blocks, service yard walls, etc., and all the acid treatment has been done by the park forces. Nearly all the various brands of Portland cement sold in the Chicago market have been used in varying quantities with equally good results.

In both methods described honest work and careful inspection are as necessary for good results as in any other first class construction. Neither method cheapens concrete work. The acid treatment slightly increases it. The surfacing with fine crushed stone adds nothing to the cost.

By the acid treatment, together with rubbing and chipping all irregularities can be corrected. With the fine crushed stone surface all irregularities and form marks are not prevented but they are greatly minimized.

In not all the work done by the second method were the results entirely satisfactory. The original specifications called for $\frac{1}{2}$ inch stone which was afterwards changed to $\frac{1}{4}$ inch. Experience taught the correct quantity of water to use for best results. But altogether both methods are so satisfactory that their use will doubtless be continued in the South Park work until something better is developed.

Buy Two Palmer Machines.

ELGIN, ILL., February 4.—The Elgin Concrete and Structural Co. has just installed two Harmon S. Palmer block machines; owing to the demand for their material, they have been obliged to double the capacity of the plant, which is located at 84-86 Grove Avenue. B. S. Parker who has been identified with the cement block industry for years has purchased a half interest in the company and will work in conjunction with J. McBride, the present manager, in taking care of the needs of the trade.

Frank E. Bryant, of Le Roy, N. Y., who has a large sand pit north of that place, has engaged in the manufacture of cement blocks.

The Norfolk Building Block and Concrete Co., Norfolk, Va., has just completed its plant for the manufacture of concrete building blocks and already has secured orders for spring delivery.

The Concrete Stone Co., Waterloo, Iowa, has elected the following officers to serve for the ensuing year. H. M. Reed, president; F. J. Fowler, vice president; F. N. LaBarre, secretary and treasurer.

The Modern Concrete Machine Co., of Terre Haute, Ind., has been organized with a capital of \$50,000.00 to manufacture concrete block machines.

As to Amount of Water.

Several practical cement users, particularly those engaged in foundation work and the reinforced branch of concrete construction, inquire as to the amount of water that should be used in the mixture. In reply, we have to say that the use of water in the concrete mixture is one of the features of the business that must be acquired by practice. From the scientific standpoint it is absolutely necessary that every particle of cement comes in contact with water, or it will remain inert and inactive. Beyond this there should be enough water to guarantee a complete and perfect mix of all particles contained in the aggregate, so that there shall be nothing contained in the mass that can possibly be dry. At the same time it should never be allowed to become sloppy.

Concrete is only at its best when mixed to the consistency of a firm slush. When this is placed in the forms it should be thoroughly tamped until it quivers like jelly and shows the water permeating entirely through the mass, but not sufficient to drain out between the cracks of the boards and trickle down on the outside. Such streams of water coming from concrete work clearly indicate that too much water is being used, and the water is probably carrying off with it a considerable amount of the finely ground cement, which is so much finer than any other part of the mass, that it can use the superfluous water as a vehicle to get away. When the centering is pulled off from such work, it will almost invariably be found to be coarse and porous, showing a poverty of the fine particles which, in conjunction with the cement, contribute all of the indispensable binding or stone making properties.

Men Fail, Not Concrete.

There have been a few failures where concrete has been employed for the construction of important buildings toward the close of last season's operations, but after all examinations are completed and the search-light of intelligence is brought to bear, there is not a single case where there would have been a failure if the instructions and specifications, as originally designed, by the engineer and accepted by the contractor had been carried out rigidly. Every failure has been traced back to somebody's blunder, to somebody's criminal carelessness, to somebody's overreaching greed to skip the necessary materials to secure safe work. Such failures are really beneficial to the industry, for they show that there really is a limit to the load that can be put upon concrete, and call for the use of both theoretical and practical intelligence and diligence, so that an overloaded column or an insufficiently supported beam may never get into any structure, and in this way only can we achieve the ideal condition operating with a perfect material.

The percentage of failures, it is true, is insignificant in comparison with the number of signally successful jobs that have been brought to completion the last year; probably the percentage is lower where concrete was been used than in any other material, and the reason why they are made public is because the new industry is constantly held out in the lime-light and is being constantly criticised by expert structural adepts, who are peculiarly interested in other classifications of building material which concrete threatens to displace, nay is already displacing to an enormous extent.

Let us have all the necessary restrictions to safeguard the public against the over-confident engineer who is so bold as to attempt to build without due regard to the old established equations of mechanics that have been established for ages, and which will never pass away.

The Haskell Cement and Block Co. has been incorporated at Brooklyn, N. Y., with a capital of \$6,500.00. The incorporators are: S. Haskell, Brooklyn; A. Weinhandler, S. R. Getlar, New York City.

The Fireproof Tile and Concrete Construction Co. has been incorporated at New York with a capital of \$10,000.00. The directors are: Hugh McGrath, J. V. McManus, New York; H. M. Spence, Bensonhurst.

The Reliable Cement Construction Co., 147 E. State Street, Trenton, N. Y., has been incorporated with a capital stock of \$50,000.00. The incorporators are: C. L. Wilson, D. S. Kennedy and E. L. Kem.

CONCRETE IN THE NORTHWEST.

Industry Has Seen Steady Growth Since Its Small Beginning Several Years Ago.

HIGHLY REGARDED AS BUILDING MATERIAL.

MINNEAPOLIS, MINN., February 15.—The Northwest offers a fertile field for the use of concrete, there being many favorable features in this section which serve to make it peculiarly attractive. Sand and gravel are usually found without difficulty or long hauling in much of the territory in this section, and in many places the excavation for a new building will uncover sand in quantities sufficient to meet all demands for the building without trouble. In fact, so plentiful are sand and gravel near to the surface that it is a not uncommon practice to place a concrete block machine at the building site and use the sand and gravel from the excavation for the production of the blocks which are destined to go into the structure. Various stones are also to be found in all directions, usually sandstone and limestone, although there is also granite and some marble in places. The presence of these materials at about all points of the Northwest makes the production of either concrete blocks or reinforced concrete, a feasible suggestion when it comes to the mind of the intending builder.

Plain concrete work has been in use in these cities for many years for various purposes, such as cement sidewalks, curb and gutter work, cellar floors, footings for basement columns, and similar work. But the earliest use of reinforced concrete is probably in the erection of a single bin elevator, about sixty feet high, at St. Louis Park, a suburb of Minneapolis, for the Peavey system. This bin was constructed by C. F. Haglin, who is a pioneer in reinforced concrete construction work in Minneapolis, and was built with reinforcement of plain rods hooped to the size of the bin, and imbedded in the concrete at regular intervals. This bin still stands, a monument to the construction of this experimental concrete work. After it had been completed and the work had reached a set, it was loaded full to give it a thorough test as to its capacities of strength. There was no doubt on the part of the owner, for he felt every confidence in the safety and solidity of the new construction. While the same form of construction had been tested successfully in other countries, it was felt by many that there were greater extremes to be undergone in this climate, of heat and of cold, and the thermal possibilities were deemed to be acute.

So the building was allowed to stand loaded for its first winter, and careful notations were taken of its endurance during the winter. The winter did not affect it in the slightest, and the test was deemed entirely sufficient to justify following it up with further elevators of like construction. A period of travel was indulged in during the winter of test, and the same construction was carefully examined in Europe by Mr. Haglin and representatives of the company.

The succeeding season the company directed Mr. Haglin to construct a concrete elevator system on the bay at Duluth, and a complete elevator, or circular bins, was constructed of reinforced concrete. These were carried along in the same manner, and being non-inflammable in all parts, they proved a generous saving in the item of insurance. It may be added that within a year, a fire broke out in a wooden structure in the elevator system, and this concrete elevator was but a short distance away. Although the heat from the burning structure was so intense as to blister on buildings at a considerable distance, the concrete structure did not suffer in the slightest. And tests of the grain within the bin nearest to the fire showed that the contents were cooled and undamaged in any degree whatever. The construction of this elevator in Duluth was followed at intervals by similar buildings in Minneapolis for other concerns. And all these concrete elevators have been a decided success in every way. They are fireproof from within and without, and do not require the carrying of insurance upon the building or the contents. They keep the grain perfectly, are free from moisture and free from rats and vermin. These elevators are so successful that

for large construction they are regarded as the most satisfactory.

With these examples to urge the use of reinforced concrete, there was still quite a period of hesitancy on the part of owners before taking up other forms. Concrete was used for footings in basement work for warehouse and other buildings, substituting for stone blocks, and in this direction increased in use steadily almost imperceptibly. So gradually did the use of concrete come that there seemed to be comparatively little suspicion on the part of people in general, including builders themselves, of the arrival of a material which was both old and new, and was destined to become a new entry in the way of materials for the construction of buildings of all kinds.

Factory of Reinforced Concrete.

What seems to be the first genuine specimen of reinforced concrete construction in the Northwest outside of these elevators, is the extension of the factory of the Northwestern Knitting Works, on Lyndale and Third Avenues North, Western and Aldrich Avenues, in Minneapolis. This factory is located somewhat away from the business and manufacturing district, and so the work progressed along the new and untried lines, so far as this section was concerned, with comparatively little public notice. The addition was three stories and basement in height, 80x185 feet in size. Bertrand & Chamberlin were the architects and C. A. P. Turner, the consulting engineer. The contract for the work was awarded to John Wunder about the first of August, 1904, and progressed during the fall and winter, being completed before spring. This was a genuine novelty in that class of construction, and the first convention of the Northwestern Cement Products Association, which was held in Minneapolis in January, 1905, found the examination of the building one of the most interesting features of the convention.

Engineer Turner had the greatest of faith in the safety of the construction, and a test load was placed upon a single panel of between seven and eight hundred pounds to the square foot, without effect. The floor was designed for a load of two hundred pounds to the square foot, so it will be seen that there was an ample margin of safety shown in the tests placed upon the new construction. The completion of this building and its use for the purpose for which it was designed, served to call general attention to the new form of construction.

The architects were as interested as anyone in the development and the use of the new material, but they were naturally somewhat conservative in their acceptance of it. They possessed a most pronounced inclination "to be shown," and whether they accepted or rejected the material, they almost unanimously expressed a view or awaiting further developments.

About concurrent in point of construction with the Knitting Works factory, were two general office buildings and transformer stations for the Twin City Rapid Transit Co. One of these was located at Eleventh Street and Hennepin Avenue in Minneapolis, and the other at College and Wabasha Avenues in St. Paul. They are hardly reinforced concrete construction, but they possess a large amount of cement work in various ways. The bases upon which the heavy machines rest, were constructed of concrete. While not of reinforced concrete, their construction marked the advancing progress of the new form of construction, with more and more concrete right along.

The holding of the convention in January of 1905, served to call general public attention to the marvelously advancing use of cement in construction work from the sidewalk and gutter to the great factory or warehouse and including the residence. At the time of the convention there were but a scattering few specimens of either reinforced concrete or concrete block structures in the Twin Cities, and these specimens were pointed out as curiosities, or freaks, depending somewhat upon the bias of the guide who indicated them. The "wise ones" were indulging in predictions as to what would happen to these structures, how the rain would penetrate them, the frost would disintegrate them, the fire would crumble them, and they would prove indeed a most disagreeable and unsatisfactory method of construction. Suffice it to say that the original builder in reinforced concrete in Minneapolis, the Northwestern Knitting Works, has this season built a further addition to its plant, including a lofty smokestack, also of reinforced concrete construction, and in addition the number of reinforced concrete has doubled every season since that time.

The opening of 1905 was attended by early preparations for a number of new buildings, and it is interesting to note that there were over a dozen structures in which reinforced concrete construction was used in whole or in part—that is, for the general construction or for the floors only. These buildings included the Security Bank or Deering Building, nine stories, which used reinforced work for the floors; the Plaza Hotel Building, five stories, which is of monolithic concrete construction throughout, including the exterior walls; the Queen Avenue bridge; the Moulton-Jordan Co. automobile garage; the armory building, which is of cement brick exterior, backed with concrete blocks, and with concrete foundations; the Washburn-Crosby Co. machine shops; the Boyd Transfer and Storage Co. storage warehouse; the Pond Building at 615-17 First Avenue South; the Dunwoody residence, with concrete floors; the Soo Line general office building; the Wilson Building; the D. M. Gilmore & Co. Building; the Nelson Paper Co., and the Minneapolis Paper Co. buildings.

The Moulton-Jordan garage contains a floor span 42 feet in length—the longest span ever attempted in the Northwest. A span was weighted to fifty tons in this building without any deflection, the space occupied being 16 feet, 8 inches, on a floor but 5½ inches thick. The same space when loaded to 100 tons, showed a deflection of but five-thirty-seconds of an inch.

The Minneapolis Paper Co.'s building at Fifth Street and Fourth Avenue South, was one of the first structures to use Mr. Turner's mushroom system of reinforced concrete construction. This building was erected during the season of 1905, and was one of the many buildings which were pointed out to the visitors at the concrete convention in January, of 1906. The year before there was but one structure to see of reinforced



J. C. JOHNSON & CO.'S BUILDING, MINNEAPOLIS; REINFORCED CONCRETE, PRINCE CONSTRUCTION CO., CONTRACTORS.

concrete construction. The following convention had the choice of over a dozen. This building was also given a most complete and thorough test of being weighted to the utmost in the trying out process as to the strength and safety of the floors. The building inspector of Minneapolis was not in any sense antagonistic to concrete construction, but he stated plainly that he intended to be conservative and to make a wide allowance for safety, in his tests. He was abundantly satisfied.

Concrete in St. Paul.

The foregoing gives a good idea of the rapid progress made in Minneapolis in the construction of reinforced concrete work. In St. Paul, the structures erected are in some instances even more inspiring, for they include larger buildings. The first reinforced concrete structure in St. Paul may be said to be the building for the Crane & Ordway Co., at Fifth and Rosabel Streets. This building is six stories high, with brick exterior walls, and reinforced concrete construction throughout for the interior. Reed & Stem were the architects for the building and George J. Grant was the general contractor. The contracts were awarded in the fall of 1904.

Among other striking buildings of reinforced concrete construction may be mentioned the wholesale hardware warehouse of Farwell, Ozmun, Kirk & Co., erected at Second and Jackson Streets. This building was planned by Louis Lockwood, architect, and was erected about a year ago, George J. Grant being the general contractor. This building is eight and nine stories in height, occupying an irregular tract. A panel, 6x16 feet, was tested

to 78 tons without a deflection perceptible, the deflection being possibly a sixty-fourth of an inch. Shortly after the building was occupied by the firm, a fire started in the packing materials which accompany the hardware, and spread to the material around goods in stock. The fire burned in the one room until the sprinkler system was started and extinguished it, but it did no damage to the structure.

Another building for a heavy hardware wholesale house is that for Nicolls, Dean & Gregg, at Eighth and Sibley Streets, in St. Paul. This house has an exterior of hard burned paving brick. The building is five stories and basement, 100x180 feet in size, of reinforced concrete construction throughout. The cost was about \$150,000.00. George J. Grant had charge of the construction and Louis Lockwood was the architect.

The new auditorium building, erected by popular subscriptions and aided by a bond issue by the city, at a cost of \$400,000.00, has concrete interior work. This building is to house the next annual convention of the Northwestern Cement Products Association. Another notable concrete structure is that of J. H. Allen & Co., wholesale grocers, for which G. H. Carsley was the architect and the Brayton Engineering Co., the engineer and contractor. This building is now about under roof. The R. Schiffman Co. has also erected a concrete laboratory, with paving brick exterior, reinforced concrete construction, on plans by Jas. Alan MacLeod, architect.

The Hackett-Walters-Gates Co., wholesale hardware, has work under way at this time completing a four-story addition to their warehouse at Fourth and Rosabel Streets. The Turner system, original method, was used, the Butler-Ryan Co. having the work in charge.

Work has been started this fall for the excavation and foundation for the Lindeke, Warner & Sons, wholesale dry goods warehouse at Fourth Street, from Broadway to Rosabel. This structure will rest upon concrete piles which have been set during the fall, and will be of the Turner mushroom system of reinforced concrete construction. The Butler-Ryan Co. has the general contract for the work, their bid on it being \$7,000.00 lower than the lowest bid for mill construction work. As the fire risk on a dry goods stock is high, the construction of this building affords a saving in both first cost and in running expense. Louis Lockwood is the architect for the building.

The new armory in St. Paul also had considerable concrete work in the floor construction. Altogether the reinforced concrete structures in St. Paul, while not so numerous as in Minneapolis, contains some structures which are larger in size than anything yet attempted in the Mill City.

The Twin Cities have set an example for the smaller cities and towns of the Northwest, and while they have not as large nor elaborate buildings as the concrete structures in the cities, yet the use of reinforced concrete is growing, steadily. One of the means which urges the use of concrete, either blocks or for concrete construction, is the use of the material in the public buildings. Already there are a number of court houses and other public buildings in the smaller towns of the Northwest, and the use of concrete is quite attractive as a means of preserving the county records from fire. In this way, the material comes to the attention of the owners and builders at first hand, and this develops more business.

The foregoing list does not cover the reinforced concrete buildings of the Twin Cities, nor do they include all the successful contractors in reinforced concrete. There are a number of other buildings which might be included in the list, but it would run to reiteration, for the work has been almost uniformly successful in every case, and each building is but another instance of the same.

Concrete Blocks in Northwest.

The work of concrete block production in the Northwest was somewhat ahead of reinforced concrete work as applied to buildings, although it did not start until some time after the concrete elevator bins were constructed. The first concrete block work in the Twin Cities seems to have been during the season of 1903, or about a year before the knitting works plant was built. The earliest blocks were probably made on the Harmon S. Palmer machines, for which William Porten, of St. Paul, was the agent, although it was not long after until several other machines were also in use in the Twin Cities. The Miracle Pressed Stone Co., of Sioux Falls, S. D., at that time, also placed a machine in operation in Minneapolis. There were two concrete block dwellings erected in the eighth ward in Minneapolis and they were deemed visionary speculations by many people, who were

perfectly sure that such a plan would never be successful. There are some yet who will question the satisfaction of concrete blocks, but they do not receive the attention nor the faith which was then accorded them, for times change and most people change with them, however consistent it may be to adhere to the faith which was held in things of business a few years before.

Harold Johnson, of Minneapolis, a well known building materials man, had an agency for a machine and did much to spread the knowledge of the new blocks, in the way of exploiting a new dwelling erected of blocks, and holding a reception to which architects, builders and others were invited to attend and inspect the building and the possibilities of cement which it revealed. Nelse Erickson and John Miller, who had been engaged in the manufacture of cement blocks and bricks at Devils Lake, N. D., also came to Minneapolis that year and engaged in the production of blocks and the sale of machines.

During that season the concrete block business expanded and spread until it seemed as though there was no end to the number of patented concrete block machines.

Since that time, the block business has somewhat sifted down to a reasonable basis. New men engaged in the business and possessed with a faith, which would move mountains mayhap, but would not make blocks without proper materials, began a propaganda which seemed to indicate that the production of concrete blocks was much like free access to the national mint with a heavy dray and no questions asked. There was considerable surprise in store for many who engaged in the business on the supposition that sand and gravel with water enough to moisten it and a dash of cement would make an impenetrable and uncrushable block. But like every other new thing the poor ones in the business sifted out, the good ones who were inexperienced, learned from failures, and proceeded to do better, and to improve their methods and their work.

The block business to-day is on a much firmer basis than ever before, for those who have been in the business any length of time, have found that they must use as much care and attention and judgment in this business as in any other, to accomplish success.

The season of 1904 found the new blocks in exceedingly great demand for foundations for dwellings. Instead of using stone for foundations—for comparatively few foundations in the city for residences are of brick—the inclination was strongly toward the new blocks. The building records show that there was a heavier demand for the blocks for foundations than possibly has existed in the succeeding seasons, although in the later seasons there has been more structures which were of concrete block superstructure as well as foundation.

The growth of the block industry required some recognition on the part of the building laws, for they were neither flesh, fish nor fowl under the old laws. So the matter was taken up by the building inspectors of both cities. Minneapolis had a building ordinance governing the use of concrete blocks considerably before St. Paul did, for in the latter city, the ordinance was pending for nearly a year, before it was finally passed. It is to be said to the credit of the departments in both cities that while they were properly conservative in the matter, they did not seek to adopt a policy of absolute distrust, but were willing to go as far in favor of the blocks as they felt they could do so with proper precaution and safety. They stated freely that they wanted the blocks to demonstrate what they were capable of doing before they took any very advanced steps in the matter.

Some Twin City Block Makers.

Pitts Bros., of Minneapolis, are active operators in cement blocks, and would be glad to take up cement brick, if they felt that they could get a good power machine for making brick which would produce the bricks of equal strength, weight and appearance. They are located at Twenty-ninth Street and Hennepin Avenue, and use the Perfection power block machine. Their plant is steam heated and electric lighted. Their bank of sand is very clean and does not require washing. It is so clean that they say that one can rub it freely and thoroughly over the hands and arms, and when through, there will be no trace of dirt. Their plant is running steadily, and they have at no time been able to keep up with orders, being always sold ahead at the point of production. At this time, with building in the moderate stage of the year, they have hardly a block on hand which is old enough to move out.

For winter use, they heat their sand and dry it out, so that in making blocks, there is no chill in the ingredients, and the block comes from the press at a temperature of possibly 100 degrees. The initial set is thus accelerated. They keep the blocks in the curing room for several days, and all blocks which are made before noon are liberally watered that night, with a hose which has the nozzle taken off, and the water allowed to run at full city pressure, upon the blocks. They cure the blocks for about four days, before allowing them to go out.

Pitts Bros. have allowed their blocks to freeze in curing and then tested to a pressure of 1,200 pounds to the inch without yielding—a pressure which is unlikely that will ever be exerted upon blocks in any ordinary building.

This firm has confined its work entirely to block making, and will not seek nor accept construction contracts. They are not in the machine business, and sell nothing but blocks, and their success in selling blocks has been marked.

One of the original block men in the Northwest was Nelse Erickson, who was in the business at Devils Lake, N. D., about four years ago, and later came to Minneapolis, where he engaged in the block and machine business. Mr. Erickson has had ample experience in making blocks, having been associated with several different concerns. Mr. Erickson declares that the dry process is not satisfactory for the production of blocks. He is game in the matter, and adheres to his beliefs, affirming that his process, which he declares to be a medium process, half way between the wet and the dry, is the best for the blockmaker. Mr. Erickson's argument is like this: He says a test of many blocks by placing them in a barrel



LYNDALE POSTOFFICE SUB-STATION, MINNEAPOLIS.
CONCRETE BLOCKS AND CEMENT BRICK;
WINNER BLOCK MACHINE CO.

of rainwater will speedily result in their being easily crushed—often in so short a time as over night; but a similar test of his own method blocks will result in their standing any test and growing harder and harder.

He also gives this easy test as to whether a concrete block is safe and reliable, or not. When it is left at the site, take a bucket of water and throw upon it. If the blocks shed the water freely and rapidly, it is a good block. But if it absorbs water, then beware, for it is not a safe block to have.

He recommends the use of good, sharp sand without dirt, clay, shales, quicksand or lime sand; the objections to these are that clay will separate from the cement in chunks and leave a cavity; dirt will not work in harmony with cement; shales take an air slack, peel off and leave a cavity; quicksand is so hard that it will not adhere to the cement, and it also works its way from the cement and the limes, and will not stand the test of fire. Furthermore, never use sand, he says, when it is slushy as the cement will curdle under that condition and will not mix with the sand. Somewhat damp sand is the best.

His process of working is as follows: Take five parts of clean, sharp sand to one part of Portland cement and mix thoroughly in a dry form in the shade. Then sprinkle and mix down to a form slightly dryer than a mortar so as to permit some tamping to dispel the air. Care must be exercised in mixing, not to make up too large a batch at once, as the cement which is not being worked will speedily take an air-slack. Put the concrete in the mould, and tamp it to get a straight edge, removing the surplus with a trowel and then strip the mould, leaving the block on the bottom board. It should be kept away from the strong rays of the summer sun for two days or longer, but needs to be left undisturbed on the bottom board only

twenty-four hours. This block will refuse water for the first twenty-four hours, but after that time, must be watered twice a day or as often as the blocks take on the natural color of cement. After six or seven days the blocks will shed water, and from that time on, do not need any special care, as they continue to harden. Placed in a barrel of soft water, they will speedily turn to flint.

A. W. Field, of Minneapolis, is using a Pettijohn machine and likes very much the feature of moving the machine and not the block. He has a good, clean bank of sand and does not have to wash it. He runs some in the winter and is now putting up a shed in which to cure blocks. He will have one or two stoves for heating the shed, and will keep the blocks in the room four or five days. He has been using a sprinkler for watering the blocks but expects to use a hose and sprinkler hereafter. He finds the most satisfactory way of wetting the blocks is to cover them with burlap and keep the burlap drenched. So long as the burlap is wet the blocks will cure nicely. Once or twice a day is often enough to wet them down. Mr. Field has taken great pains with his block-curing and has produced blocks which have a distinctive and characteristic ring about them, which stamps them as good, serviceable and substantial blocks.

G. W. Papke, of Minneapolis, uses two machines, the Thayer and the Peerless. For winter blocks, he cures in a basement, where it is warm and does not wet them, finding that winter made blocks are better without wetting, as they do not require it. Mr. Papke is making blocks for an experimental barn, to test out and see how they will serve in a house for his own use, which he expects to build later. The barn is not yet built, although he has laid up a wall to see the appearance. He is using a dark red color, in a smooth faced block, with rough-faced trimmings. The latter are not rock-face, but are simply ornamental.

John Miller, of Minneapolis, of the Winner Block Machine Co., is a pioneer in cement block and brick making in the Northwest, having been in the business for nearly ten years. He took up the matter in Devils Lake, N. D., almost ten years ago, and after extended experiments, produced blocks and bricks which sustained the heaviest kinds of tests. He built the first building erected of cement brick in North Dakota. For winter curing he recommends a room at a temperature of about 40 degrees, and the blocks should be kept inside for a week or ten days. They should be watered when they begin to show their natural color, but not until then. By so doing, it works to avoid the efflorescence problem. He has never had to wash sand in Minneapolis, and has elsewhere used sand that had more or less dirt in it without bad results. While he does not approve of dirt, he says that he has found that a trifle does not seem to affect the block particularly. In the matter of coloring, he is at variance with the views of many, for he mixes the color with the sand and not with the cement. He uses sand that is not absolutely dry, but just slightly damp, and mixes the color with it, then adds the cement. The results have been more satisfactory than when the manner of mixing the cement and the color was followed. In his experience in the latter method, it resulted in weakening the cement of some of its strength, while by mixing the sand and color and then adding the cement, the latter seemed to retain its strength without affecting the coloring. He strongly recommends power mixing, as against hand mixing, believing that it gives double the result of hand work. His experience in brick work is much the same as in blocks. Both require the same kind of treatment. The mix should not be so wet for either in the winter as in the summer, but the policy is to get as wet a mix as can possibly be used and not tear the block when stripping down the mould. The wetter the mix, the better the result.

The Faxon Cement Building Co., Faxon, Okla., has been incorporated with a capital stock of \$50,000.00. The incorporators are: Jacob F. Piercy and Charles L. Thornton, of Faxon; John W. Bartholomew, of Lawton.

The outbuildings and concrete mixing plant of the New York Central Railroad Co., near Yonkers, N. Y., were destroyed by fire on December 27, causing a loss of \$8,000.00.

Hudson Concrete Co. has been incorporated at Jersey City, N. J., with a capital of \$100,000.00. The incorporators are: T. H. Hall, F. H. Bermitt, Thomas G. Haight. George G. Tennant is agent in charge.

1-17-06 1m-10899-Byck

ATLANTIC & BIRMINGHAM CONSTRUCTION CO.

OFFICE OF
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CEMENT TEST REPORT

No. 44

Sample Received APRIL 13TH 1906

Car No. N.Y.C. 16063 Name

KOSMOS

Class PORTLAND

To be used IN 2 ABTMTS-90 FT. SPAN-OVER A & W P 1/2 M & B. R. R.'S-MILE 91

TENSILE STRENGTH

No.	PROPORTIONS		Per Ct. Water	Date Made	Time Made	Date Broken	Time Broken	Temp. at Mixing		Time in Air		Time in Water		Total Time		POUNDS 1 Sq. Inch Section	
	Cement	Sand						Air	Water	Days	Hrs.	Days	Hrs.	Days	Hrs.	Briguettes	Average
A 44	NEAT		22	4-14-06	9:30AM	4-15-06	9:30AM	78	68	1				1		310	
B	"	"	"	"	"	"	"	"	"	1				1		355	350
C	"	"	"	"	"	"	"	"	"	1				1		325	
D	"	"	"	"	"	4-21-06	"	"	"	1		6		7		670	
E	"	"	"	"	"	"	"	"	"	1		6		7		695	675
F	"	"	"	"	"	"	"	"	"	1		6		7		660	
G	"	"	"	"	"	5-12-06	"	"	"	1		27		28		850	
H	"	"	"	"	"	"	"	"	"	1		27		28		860	850
I	"	"	"	"	"	"	"	"	"	1		27		28		840	
J	"	"	"	"	"	7-13-06	"	"	"	1		89		90		885	
K	"	"	"	"	"	"	"	"	"	1		89		90		930	917
L	"	"	"	"	"	"	"	"	"	1		89		90		935	
M	1	3	11	4-14-06	10AM	4-21-06	10AM	78	68	1		6		7		95	
N	1	3	"	"	"	"	"	"	"	1		6		7		110	105
O	1	3	"	"	"	"	"	"	"	1		6		7		110	
P	1	3	"	"	"	5-12-06	"	"	"	1		27		28		220	
Q	1	3	"	"	"	"	"	"	"	1		27		28		200	203
R	1	3	"	"	"	"	"	"	"	1		27		28		190	
S	1	3	"	"	"	7-13-06	"	"	"	1		89		90		280	
T	1	3	"	"	"	"	"	"	"	1		89		90		230	250
U	1	3	"	"	"	"	"	"	"	1		89		90		240	

FINENESS: Passing No. 50 Sieve 100 per cent.

" " 74 Sieve 99 per cent.

" " 100 Sieve 93 per cent.

Specific Gravity 3.11 200 Sieve 80 per cent.

Transverse Strength-1 Sq. Inch Section

Initial Set 5 HOURS

Final Set 8 HOURS

Color BLUISH GRAY

Temp. Air. 70°

Per Cent Water. 22

Temp. Water. 66°

CHECKING AND CRACKING OR SOUNDNESS AND CONSTANCY OF VOLUME

Normal Tests PAT IN MOIST AIR 24 HRS., THEN IN WATER 27 DAYS: SOUND & HARD

PAT IN MOIST AIR 24 HRS., THEN IN WATER 27 DAYS:- SOUND & HARD
COLOR- UNIFORM.

Accelerated Tests

PAT IN MOIST AIR UNTIL INITIAL SET, THEN IN BOILING WATER 3 HRS:-
SOUND & HARD

REMARKS: GRADE: 1ST

ACCEPTED:

H.B. Thompson
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TESTS.



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IF you had a **valid basic patent** controlling the **cement** industry and had spent **tens of thousands** of dollars and **five years** of strenuous effort to bring a suit under it to a final hearing before the Circuit Court of the U. S. and had argued the case pro and con for **five days** before an able Judge of that Court, and had waited nearly **three months** while that Court was preparing and was about to announce to the world its opinion of the scope and validity of that patent, **WOULD YOU**, if you believed you were about to receive a sweeping vindication and an indisputable right to peremptory preliminary injunction against every coal-burning cement manufacturer in the United States—we say, **WOULD YOU** precipitately **withdraw** your suit and telegraph the Judge to withhold his decision and to **dismiss** the suit?

If you should learn of a patent having **SUCH** a record would you be afraid of it or merely amused?

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Flame is Earthquake-proof.

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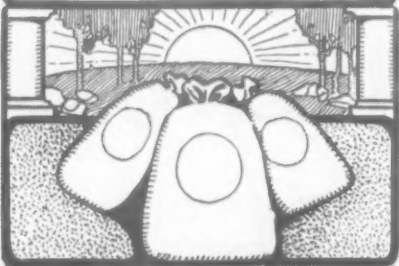
Vol. II October, 1906 No. 11

CEMENTOLOGY

Circulation 10,000

Standard Requirements
of
Tensile Strength
and
Constancy of Volume

Published by
The Whitehall Portland Cement Co.
Philadelphia
Atlanta Boston



Front and back covers of No. 11, Vol. II

CEMENTOLOGY

Jim Smith goes fishing with Old Josh Bent.

Read the October number of Cementology
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at the same time get a few pointers on

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The comprehensive drawing on pages 6 and 7
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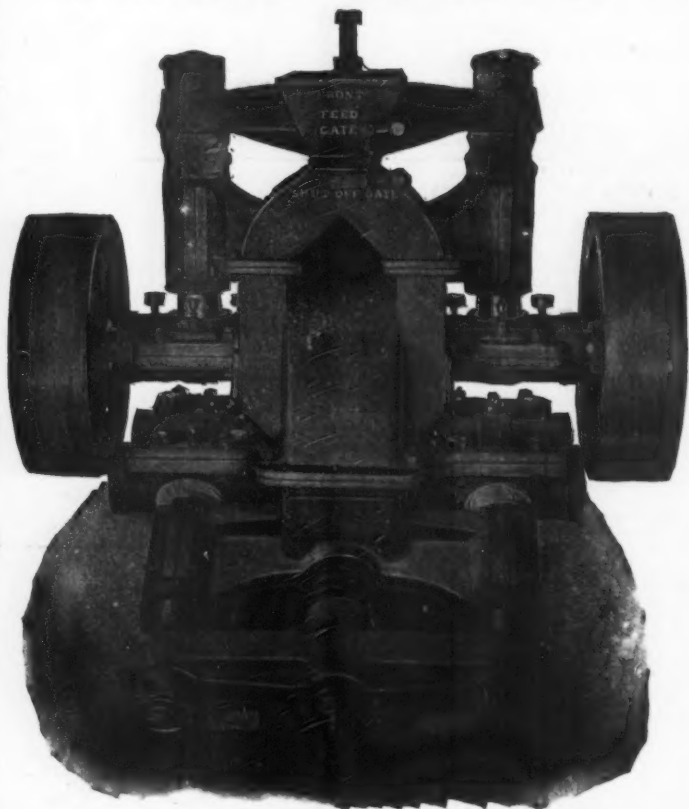
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Takes one inch feed. Grinds to any fineness
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CEMENT CLINKER,	40 bbls.	to 98%	20 Mesh.
CEMENT CLINKER,	12 "	" "	100 "
LIMESTONE,	2½ tons	" "	200 "
LIME,	4 "	" "	100 "
ROSENDALE CEMENT,	43 bbls.	" 90%	50 "
QUARTZ TRAP-ROCK,	4 tons	" "	40 "

You can easily figure from this what a
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Tell 'em you saw it in ROCK PRODUCTS.

Church of Concrete Blocks.

The Hollow Block Concrete Manufacturing Co., 129 Decatur Street, New Orleans, La., has just finished a handsome church building for the Second M. E. Church South, on Burgundy Street between Music and St. Roith. The church is constructed of hollow concrete block, is of Gothic design and is said to have been finished much more economically than the same edifice could have been erected by the use of brick in spite of the fact that it is quite as handsome as if cut stone had been used in this construction. Albert Godchaux, president of the company, says they are well satisfied with the success of introducing concrete construction in New Orleans, for there is no location in the country where concrete is so well adapted for general structural purposes as the Crescent City. The low cost at which sand can be secured and the general climatic conditions are favorable to the building of residences of concrete, while the fire resisting feature is a valuable asset which builders in that section are just beginning to understand.



HANDSOME RESIDENCE BUILT OF BLOCKS MADE ON NO-DAMP CONCRETE BLOCK MACHINE CO.'S MACHINE.

No-Damp Concrete Block Machine.

The No-Damp Concrete Block Machine Co., of Minneapolis, Minn., has a machine which makes a block that it is claimed is absolutely dry when properly laid. This company makes a two piece wall which is entirely different from anything on the market. The walls can be made from two to eight inches thick, making it possible to build a wall of any desired thickness. The machine was exhibited at the Chicago and St. Paul conventions and was pronounced a success by the critics and general public.

Asbestos Roofing Slate.

A comparatively new style of roofing slate, said to be fireproof and waterproof, is composed of asbestos fiber and hydraulic or Portland cement, and is furnished in Newport gray or natural color. It is claimed that these slates do not change color upon exposure to the weather in any climate and that they do not crack when exposed to fire, as natural slates sometimes do. They are manufactured under great pressure and absorb, when fresh only about one-eighth of their weight of water.

The hydration and subsequent crystallization which takes place converts them, the makers claim, into absolutely impermeable roof coverings, calculated to defy all changes of the weather and of the season. The shingles may be cut over the slater's jack or with the ordinary cross-cut saw and fit all hips, ridges, valleys and other variations of the roof.

They may be walked up with impunity, as they do not break like the natural slate; they may be frozen and thawed any number of times, as they do not split at the nail hole and fall out, as does the natural slate when subjected to similar treatment. When asbestos shingles are nailed to the rough sheathing boards of the roof, according to the French or diagonal method, with the tips tied down with the copper storm nail, they make a roof so firmly tied together that it is practically impossible to loosen it.—New York Commercial.

ATTENDANCE AT COLUMBUS.

Following is the list of those who registered at the convention of the National Builders' Supply Association at Columbus. Names are classed by states and numbers refer to the order of registration:

- 45 Chas. Warner, Wilmington, Del., Chas. Warner Co.
- 46 C. C. Bye, Wilmington, Del., Chas. Warner Co.
- 36 F. D. Meacham, Chicago, Ill., Meacham & Wright Co.
- 37 F. S. Wright, Chicago, Ill., Meacham & Wright Co.
- 112 H. H. Halliday, Cairo, Ill.
- 113 H. C. Irwin, Springfield, Ill.
- 131 A. E. Preuss, Utica, Ill., Illinois Hydraulic Cement Mfg. Co.
- 132 C. B. Lihme, Utica, Ill., Illinois Hydraulic Cement Mfg. Co.
- 142 Edward Hennessey, Chicago, Ill., Alpha Portland Cement Co.
- 178 C. E. Moellering, Ft. Wayne, Ind., C. E. Moellering & Sons.
- 179 E. H. Moellering, Ft. Wayne, Ind., C. E. Moellering & Sons.
- 209 S. Q. Fulton, Chicago, Ill., U. S. Gypsum Co.
- 219 E. K. Cormack, Chicago, Wisconsin Lime & Cement Co.
- 231 J. O. Freeman, New Windsor, Ill., The New Windsor Clay Mfg. Co.
- 250 G. J. Parker, Decatur, Ills., V. H. Parker & Sons Co.
- 263 W. G. Schlottbeck, Chicago, Ill., U. S. Gypsum Co.
- 266 W. W. Nicol, Peoria, Ill., Peoria Fuel Co.
- 275 A. C. Tobin, Chicago, Ill., General Fire Profing Co.
- 278 John McFadden, Indianapolis, Ind.
- 279 E. D. Logsdon, Indianapolis, Ind., Peoples' Coal and Cement Co.
- 293 B. F. Affleck, Chicago, Ill., Universal Portland Cement Co.
- 301 W. F. Kerlin, Rockfield, Ind., Automatic Concrete Post Machine.
- 305 Melville M. Smith, Kimmell, Ind., Art Portland Cement Co.
- 317 John E. Britt, Chicago, Ill., Trav. Agt. Traders' Desp. Transportation Co.
- 30 A. B. Meyer, Indianapolis, Ind., A. B. Meyer & Co.
- 31 J. C. Armfield, Indianapolis, Ind., A. & C. Stone and Lime Co.
- 43 Peter Martin, Huntington, Ind., Ohio and Western Lime Co.
- 50 F. E. Paulson, Indianapolis, Ind., Lehigh Portland Cement Co.
- 91 W. E. Cobean, Chicago, Ill., Wolverine Portland Cement Co.
- 103 Lewis McNutt, Brazil, Ind.
- 119 Fred Goepfer, Indianapolis, Ind.
- 120 H. A. Rogers, Indianapolis, Ind., A. B. Keppert & Co.
- 145 R. R. Fish, Ft. Wayne, Ind., Sandusky Portland Cement Co.
- 187 A. E. Bradshaw, Indianapolis, Ind., Indianapolis Mortar and Fuel Co.
- 195 Charles A. Hoover, Muncie, Ind., Muncie Builders Supply Co.
- 205 W. H. Yaler, North Vernon, Ind., Grand Rapids Plaster Co.
- 207 L. B. Sampson, Indianapolis, Ind., Art Portland Cement Co.
- 215 D. L. Mather, Richmond, Ind., Mather Bros.
- 216 Samuel Mather, Richmond, Ind., Mather Bros.
- 217 F. R. Charles, Richmond, Ind., City Civil Engineer, Richmond, Ind.
- 238 W. N. Richter, Rochester, Ind., Art Portland Cement Co.
- 240 John A. George, Indianapolis, Ind., Indianapolis Coal Co.
- 271 F. E. Malott, Indianapolis, Ind., Maiott Coal and Lime Co.
- 272 E. M. Baltes, Ft. Wayne, Ind., E. M. Baltes & Co.
- 53 H. B. Lyman, Lafayette, Ind.
- 198 J. W. Landrum, Terre Haute, Ind., Terre
- 6 John F. Morris, Louisville, Ky., Kentucky Wall Plaster Co.
- 10 Fred K. Irvine, Louisville, Ky., Rock Products.
- 33 Elgar H. Defebaugh, Louisville, Ky., Rock Products.
- 34 R. M. Hooe, Louisville, Ky., Rock Products.
- 38 J. A. Fairleigh, Louisville, Ky., Western Cement Co.
- 167 W. H. Ford, Louisville, Ky., Kosmos Portland Cement Co.

- 92 Henry W. Classen, Baltimore, Md., Maryland Lime and Cement Co.
- 97 Chas. H. Claiborne, Baltimore, Md., Union Mining Co.
- 93 W. F. Baker, Detroit, Mich., C. K. Williams & Co.
- 94 W. G. Wing, Detroit, Mich., C. K. Williams & Co.
- 99 F. J. Van Allen, Jackson, Mich., Michigan Sewer Pipe Co.
- 100 J. E. Barlett, Jackson, Mich., J. E. Bartlett Company.
- 114 W. C. Anderson, Detroit, Mich., Berry Bros. Ltd.
- 140 H. C. Houghten, Detroit, Mich., H. Houghten.
- 143 H. Houghten, Detroit, Mich.
- 239 E. E. Evans, Bay City, Mich., Boutell Bros. & Co.
- 246 Charles Magee, Detroit, Mich., Berry Bros.
- 269 James Leenhouts, Grand Rapids, Mich., Grand Rapids Plaster Co.
- 270 A. H. Apted, Grand Rapids, Mich., Grand Rapids Plaster Co.
- 284 Geo. T. Calvert, Detroit, Mich., J. Calvert's Sons.
- 303 A. W. Munsell, Detroit, Mich., Detroit River Gravel Co.
- 1 Gordon Willis, St. Louis, Mo., Hunkins-Willis Lime and Cement Co.
- 2 H. H. Plummer, Menasha, Wis.
- 4 Geo. S. Cobb, St. Louis, Mo., Glencoe Lime and Cement Co.
- 5 Ph. J. Dauerheim, St. Louis, Mo., Chas. W. Goetz Lime and Cement Co.
- 24 J. P. Kean, St. Louis, Mo., Acme Cement Co.
- 25 J. R. Dougan, St. Louis, Mo., Acme Cement Co.
- 27 Harry B. Warner, Louisville, Ky., Rock Products.
- 41 M. L. Holman, St. Louis, Mo., Hunkins-Willis Lime and Cement Co.
- 42 F. P. Hunkins, St. Louis, Mo., Hunkins-Willis Lime and Cement Co.
- 47 D. S. Hunkins, St. Louis, Mo., Hunkins-Willis Lime and Cement Co.
- 168 Chas. H. Leffingwell, St. Louis, Mo., Laclede Fire Brick Co.
- 277 R. H. Miller, St. Louis, Mo., Christy Fire Clay Co.
- 302 W. A. Chestnut, St. Louis, Mo., General Fireproofing Co.
- 254 J. C. Squires, Joplin, Mo., Jeffrey Mfg. Co.
- 136 Ambrose Tomkins, Newark, N. J., Tomkins Bros.
- 207 H. J. Willis, Winona, Minn.
- 190 Jas. G. Lincoln, Boston, Mass., Waldo Bros.
- 101 W. W. Bale, New York, N. Y., Pennsylvania Cement Co.
- 117 F. C. Lauer, Rochester, N. Y., Rochester Lime Co.
- 126 M. A. Reeb, Buffalo, N. Y.
- 130 Jos. J. Mandery, Rochester, N. Y.
- 138 E. B. Stanley, Clinton, N. Y., Clinton Metalic Paint Co.
- 144 C. H. Brigham, New York, Atlas Portland Cement Co.
- 157 A. C. Horn, New York.
- 169 T. G. Barr, New York, N. Y., Vulcanite Portland Cement Co.
- 174 F. L. Kane, Jr., New York, Sackett Plaster Board Co.
- 194 Albert Oliver, New York, The Clinton Fireproofing System.
- 221 Chas. C. Calkins, Buffalo, N. Y., J. B. King & Co.
- 227 P. A. Tomes, New York, Atlas Portland Cement Co.
- 228 C. A. Kimball, New York, Atlas Portland Cement Co.
- 229 T. M. McGiff, New York, Atlas Portland Cement Co.
- 230 W. E. Miner, New York, Atlas Portland Cement Co.
- 253 W. C. Newman, Buffalo, N. Y., Newmans Akron Cement Co.
- 292 Wm. W. Beach, New York, Pennsylvania Portland Cement Co.
- 3 C. A. Erwin, Columbus, Ohio, United States Gypsum Co.
- 7 R. Kind, Toledo, Ohio, Toledo Builders' Supply Co.
- 8 E. F. Muhler, Wellston, Ohio, Alma Cement Co.
- 9 H. C. Ensign, Columbus, Ohio, Johnson Coal and Mining Co.
- 11 Harry S. West, Toledo, Ohio, National Builders' Supply Association.
- 12 C. S. Bigsby, Cleveland, Ohio, the Garry Iron and Steel Co.

- 13 Chas. E. Justus, Cleveland, Ohio, the Garry Iron and Steel Co.
- 14 Samuel Siddall, Cleveland, Ohio, the Garry Iron and Steel Co.
- 15 G. R. Hackney, Newark, Ohio, Newark Artificial Stone and Plaster Co.
- 16 C. E. Cochran, Newark, Ohio, Newark Artificial Stone and Plaster Co.
- 20 W. W. Hoffman, Lorain, Ohio, Lorain Supply Co.
- 21 W. E. Shearer, Cleveland, Ohio, United States Gypsum Co.
- 22 H. F. Dorchester, Cleveland, Ohio, United States Gypsum Co.
- 23 D. W. Lovejoy, Toledo, Ohio, Ohio Builders' Supply Co.
- 29 Earle W. Hawke, Columbus, Ohio, American Sewer Pipe Co.
- 32 M. E. Murray, Youngstown, Ohio, General Fireproofing Co.
- 44 G. B. Christian, Sr., Marion, O., Ohio and Western Lime Co.
- 49 R. L. Gueisser, Zanesville, Ohio, Hydraulic Pressed Brick Co.
- 52 A. R. Black, Cleveland, Ohio, American Gypsum Co.
- 54 F. B. Jones, Toledo, Ohio, Acme Coal, Wood and Builders' Supply Co.
- 55 J. J. Urschel, Toledo, Ohio, Acme Coal, Wood and Builders' Supply Co.
- 56 E. S. Walton, Youngstown, Ohio, Youngstown Ice Co.
- 57 L. C. Koplin, Akron, Ohio, The Thos. Phillips Co.
- 58 W. E. Wright, Akron, Ohio, Peterson & Wright.
- 59 Chas. M. Nichlaus, Columbus, Ohio, American Sewer Pipe Co.
- 61 F. H. Hunter, Columbus, Ohio, Columbus Contractors' Supply Co.
- 62 J. P. Carlile, Columbus, Ohio.
- 63 A. Hamilton, Columbus, Ohio, Hamilton-Parker Co.
- 64 E. A. Parker, Columbus, Ohio, Hamilton-Parker Co.
- 65 R. S. Rhoads, Columbus, Ohio, American Sewer Pipe Co.
- 66 E. C. Kissinger, Columbus, Ohio.
- 67 T. T. VanSwearingen, Columbus, Ohio, South Side Lumber Co.
- 68 Frank E. Ferris, Columbus, Ohio, Ferris Steam Mortar Works.
- 69 W. B. Ferris, Columbus, Ohio.
- 70 David Shitzer, Columbus, Ohio, Jacob Rapp & Co.
- 71 Chas. Frank, Columbus, Ohio, Columbus Coal and Lime Co.
- 72 Henry Neareamer, Columbus, Ohio, Columbus Coal and Lime Co.
- 73 C. G. Jones, Columbus, Ohio.
- 74 Ernest Wollenweber, Columbus, Ohio.
- 75 O. A. Spear, Columbus, Ohio.
- 76 Fred Salzgeber, Columbus, Ohio.
- 77 S. S. McDowell, Columbus, Ohio, Wassall Fire Brick Co.
- 78 C. A. Doan, Columbus, Ohio, Nelsonville Sewer Pipe Co.
- 79 C. H. Frank, Columbus, Ohio, Nelsonville Sewer Pipe Co.
- 80 C. L. Mead, Columbus, Ohio, Acme Paving Co.
- 81 W. O. Taylor, Columbus, Ohio, Columbus Macadam Co.
- 82 Nelson Ruggles, Columbus, Ohio, Rock Wall Plaster Mfg. Co.
- 83 Martin Murphy, Columbus, Ohio, Acme Paving Co.
- 84 F. H. Angell, Columbus, Ohio, Jeffrey Mfg. Co.
- 85 D. W. McGrath, Columbus, Ohio, Columbus Contractors Supply Co.
- 86 W. M. Scott, Columbus, Ohio, Hayden Automatic Concrete Block Machine Co.
- 87 J. Y. Bassell, Columbus, Ohio, Secretary Board of Trade.
- 88 J. W. Jeffrey, Columbus, Ohio, Jeffrey Mfg. Co.
- 89 R. H. Jeffrey, Columbus, Ohio, Jeffrey Mfg. Co.
- 90 J. F. Angell, Columbus, Ohio, United Cement Machinery Co.
- 95 R. E. Doyl, Toledo, Ohio, The Ohio Builders' Supply Co.
- 104 F. H. Holland, Cleveland, Ohio, Kelley Island Lime and Transport Co.
- 105 W. S. Griswold, Elyria, Ohio, Elyria Plaster Company.
- 106 O. M. Reams, Cleveland, Ohio, Cleveland Asbestos Plaster Co.
- 107 Alan G. Simpson, Columbus, Ohio, Columbus Contractors Supply Co.
- 108 Chas. Niermeyer, Columbus, Ohio, Columbus Coal and Lime Company.
- 109 W. W. Fishack, Toledo, Ohio, The Fishack Plaster Co.
- 110 L. E. Fishack, Toledo, Ohio, The Fishack Plaster Co.
- 111 L. G. Powell, Toledo, Ohio, The Fishack Plaster Co.
- 118 Wm. E. Reinkens, Columbus, Ohio, Columbus Coal and Lime Co.
- 121 E. J. Reinkens, Columbus, Ohio, Ohio Coal and Foundry Supply Co.
- 122 J. E. Cooper, Akron, Ohio, Robinson Clay Product Co.
- 123 T. G. A. Middleton, Akron, Ohio, Robinson Clay Product Co.
- 124 E. H. Fishack, Port Clinton, Ohio, Consumers Gypsum Co.
- 127 C. J. McCormick, Columbus, Ohio, Cleveland Builders' Supply Co.
- 128 W. C. Hunter, Columbus, Ohio, Columbus Contractors' Supply Co.
- 129 G. H. Charls, Middletown, Ohio, The American Rolling Mill Co.
- 134 F. E. Anthony, Cleveland, Ohio, Cleveland-Akron Bag Co.
- 135 E. J. Warner, Cleveland, Ohio, Cleveland-Akron Bag Co.
- 137 Weber W. Sebald, Middletown, Ohio, American Rolling Mill Co.
- 139 John D. Owens, Marion, Ohio, John D. Owens & Son, Owens, Ohio.
- 146 E. S. Cannell, Cleveland, Ohio, The Hamlet Lumber and Supply Co.
- 147 Edward McGlone Koch, Sandusky, Ohio, Castalia Portland Cement Co.
- 148 Wm. Michael, Columbus, Ohio, Hocking Valley Railroad Co.
- 149 H. Willoughby, Columbus, Ohio, Scioto Valley Supply Co.
- 150 D. W. Evans, Columbus, Ohio, The Columbus Macadam Co.
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- 153 F. L. Rumer, Columbus, Ohio, T. & O. C. Ry.
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- 161 John Jauch, Columbus, Ohio, J. Rapp & Co.
- 164 A. Bringardner, Columbus, Ohio, Junction City Sewer Pipe Co.
- 165 Ernest L. Abbott, Columbus, Ohio, Lehigh Valley Ry. Co.
- 175 O. C. Maurer, Toledo, Ohio, Norris & Christian Stone and Lime Co.
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- 177 A. E. Munz, Toledo, Ohio, Buckeye Builders Supply Co.
- 180 P. Weigerding, Defiance, Ohio.
- 181 Geo. B. Christian, Jr., Marion, Ohio, Norris & Christian Stone and Lime Co.
- 182 H. B. McMaster, Youngstown, Ohio, The General Fire Proofing Co.
- 184 Chas. F. O'Donnell, Bellefontaine, Ohio, Buckeye Portland Cement Co.
- 185 W. Whaley, Akron, Ohio, The Thomas Phillips Co.
- 188 J. W. Eichelberger, Dayton, Ohio, T. D. Eichelberger & Sons.
- 189 Lawrence Hitchcock, Cleveland, Ohio, Kelley Island Lime & Transport Co.
- 191 G. H. Gengnagel, Dayton, Ohio, Schaeffer & Gengnagel.
- 192 Robert L. Beck, Cleveland, Ohio, Cleveland Builders Supply Co.
- 196 W. O. Maddux, Xenia, Ohio, W. O. Maddux, Haute Coal & Lime Co.
- 199 Henry Angell, Cleveland, Ohio, Kelley Island Lime & Transport Co.
- 200 J. W. Fulton, Columbus, Ohio, American Sewer Pipe Co.
- 201 K. E. Pew, Warren, Ohio, The Elastic Pulp Plaster Co.
- 202 F. F. Cingan, Youngstown, Ohio, The Mahoning Builders Supply Co.
- 203 C. Buxton, Toledo, Ohio, T. & O. C. Ry.
- 204 Frank Humphrey, Columbus, Ohio, Federal Brick Co.
- 206 S. E. Fox, Fostoria, Ohio, Grand Rapids Plaster Co.
- 212 E. Harpham, Akron, Ohio, Buckeye & Summit Sewer Pipe Co.
- 213 H. Turner, Marysville, Ohio.
- 214 F. C. Pew, Steubenville, Ohio, The Ohio Plaster & Supply Co.
- 222 W. W. Coney, Cincinnati, Ohio, The Moores-
- 232 A. S. Freeman, Steubenville, Ohio, Ohio Plaster Co.
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- 235 O. F. Ferriman, Cleveland, Ohio, The Forrester Plaster Co.
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- 237 A. H. Gallagher, Toledo, Ohio, A. H. Gallagher.
- 241 W. A. Fay, Cleveland, Ohio, The Masons Supply Co.
- 242 E. C. Baker, Columbus, Ohio, Diamond Portland Cement Co.
- 243 F. T. Andrews, Cleveland, Ohio, Andrews Bros.
- 244 H. M. Terrell, Cleveland, Ohio, Mason Supply Co.
- 245 F. D. Sullivan, Columbus, Ohio, D. E. Sullivan & Son.
- 247 J. M. Smith, Newark, Ohio, The P. Smith & Sons Lumber Co.
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- 249 J. B. Lindsey, Middleport, Ohio, Tolbott & Lindsey.
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- 252 R. E. Smith, Columbus, Ohio, South Side Lumber Co.
- 255 Walter S. McCammon, Cincinnati, Ohio, L. H. McCammon Bros.
- 256 E. C. Griswold, Elyria, Ohio, Elyria Plaster Co.
- 257 E. A. Benninghofen, Hamilton, Ohio.
- 258 P. H. Degnan, Toledo, Ohio, Toledo Builders' Supply Co.
- 259 M. E. McCormick, Gallipolis, Ohio, G. H. McCormick's Sons.
- 260 H. F. Rowse, Akron, Ohio, Robinson Clay Product Co.
- 261 E. J. Tully, Cincinnati, Ohio, Contractors' and Builders' Supply Co.
- 262 S. V. Peppel, Columbus, Ohio.
- 264 W. T. Akers, Akron, Ohio, Akron Supply Company.
- 265 Chas. B. Akers, Akron, Ohio, Akron Vitri-fied Clay Mfg. Co.
- 268 P. B. Beery, Sandusky, Ohio, Sandusky Portland Cement Co.
- 273 D. E. Binns, Uhrichsville, Ohio, Binns' Stucco Retarder Co.
- 274 Joseph Loeb, Uhrichsville, Ohio, Buckeye Fire Clay Co.
- 276 W. M. Adelberger, Dayton, Ohio, Star Coal and Cement Co.
- 281 Geo. D. Elwill, Cleveland, Ohio, United States Gypsum Co.
- 283 I. J. Rowe, Cleveland, Ohio, Struthers Furnace Co.
- 285 H. E. Kendrick, Delaware, Ohio, Scioto Lime and Stone Co.
- 287 Louis J. Snyder, Lancaster, Ohio.
- 288 E. A. Evans, Zanesville, Ohio, Zanesville Grain and Builders' Supply Co.
- 289 E. N. Hunting, Youngstown, Ohio, General Fire Proofing Co.
- 290 W. P. Holst, Toledo, Ohio, W. O. Holst Builders' Supply Co.
- 291 Geo. Moore, Columbus, Ohio, Long & Moore.
- 294 Jos. P. Degnan, Toledo, Ohio, Toledo Builders' Supply Co.
- 296 Edw. G. Way, Toledo, Ohio, National Builders' Supply Association.
- 299 W. L. Ogden, Lisbon, Ohio, the Excelsior
- 208 Fred C. Bishop, Centerburg, Ohio, Fire Clay Co.
- 300 Chas. W. Riddle, Delaware, Ohio, the Excelsior Fire Clay Co.
- 304 W. H. Plant, Columbus, Ohio, E. C. Kissinger.
- 306 V. D. McDowell, Columbus, Ohio, Wassall Fire Brick Co.
- 307 W. O. Scheibell, Columbus, Ohio, Scheibell.
- 308 C. J. Wright, Columbus, Ohio, Ohio Dredging Co.
- 309 Claud W. Filer, Toledo, Ohio, Logan Brick Mfg. Co.
- 310 C. H. McGrath, Columbus, Ohio, Columbus Cont. Supply Co.
- 311 W. J. Wise, New Philadelphia, Ohio, W. J. Wise & Bro.
- 312 A. F. Kramer, Columbus, Ohio, Hayden Automatic Block Co.
- 313 Geo. M. Friel, Columbus, Ohio, Hayden Automatic Block Co.
- 314 F. R. Smallman, Wauseon, Ohio, Smallman.

- 315 J. W. Thomson, Coshocton, Ohio, A. H. Thomson & Son.
- 316 J. Q. Adams, Coshocton, Ohio, Coshocton Lumber Co.
- 318 A. L. Gilmore, Columbus, Ohio, Agt. Traders' Desp. Transportation Co.
- 319 Howard B. Arnold, Dayton, Ohio, the Rice Wall Plaster Co.
- 320 A. B. Luten, Toledo, Ohio, Metropolitan Paving Brick Co.
- 321 F. M. Brust, Columbus, Ohio, J. Rapp & Co.
- 322 C. F. Miller, Cleveland, Ohio, Cleveland Builders' Supply Co.
- 323 David C. Mehan, Columbus, Ohio, the Ironclay Brick Co.
- 324 Jacob Jacobs, Toledo, Ohio.
- 325 C. E. Coates, Columbus, Ohio, Columbus Cont. Supply Co.
- 326 S. P. Cross, Columbus, Ohio, Columbus Cont. Supply Co.
- 327 F. L. Stewart, Niles, Ohio, Sykes Metal Lath and Roofing Co.
- 329 C. T. McCracken, Columbus, Ohio, C. T. McCracken & Co.
- 330 C. E. Connell, Columbus, Ohio, C. T. McCracken & Co.
- 331 C. T. Sharp, Youngstown, Ohio, Buckeye Wall Plaster Co.
- 333 W. L. Dugan, Columbus, Ohio, General Fireproofing Co.
- 17 J. C. Neely, Pittsburg, Pa., Miller & Coulson.
- 18 H. F. Rauch, Philadelphia, Pa., Whitehall Portland Cement Co.
- 40 C. M. Camm, Philadelphia, Pa., American Cement Co.
- 51 Kent E. Lyman, Jamestown, Pa., Jamestown Paint and Varnish Co.
- 60 Morris M. Hunter, Philadelphia, Pa., Edison Portland Cement Co.
- 96 J. J. Haas, Pittsburg, Pa., Houston Bros. Co.
- 98 S. B. Goucher, Pittsburg, Pa., American Sewer Pipe Co.
- 125 Luther Keller Scranton, Pa., Luther Keller.
- 141 James M. Thayer, Erie, Pa., O. C. Thayer & Son.
- 155 S. M. Houston, Pittsburg, Pa., Houston Bros.
- 162 Jos. W. Zipperlein, Philadelphia, Pa., Wm. G. Hartranft Cement Co.
- 159 Geo. T. Heppenstall, Pittsburg, Pa., Heppenstall & Marquis.
- 166 F. M. Hoover, Philadelphia, Pa., Bath Portland Cement Co.
- 170 S. G. Stradley, Philadelphia, Pa., Vulcanite Portland Cement Co.
- 171 J. S. Burton, Pittsburg, Pa., Burton Powder Co.
- 172 W. O. Dunn, Pittsburg, Pa., Burton Powder Co.
- 173 D. K. Thompson, Jr., Pittsburg, Pa., Houston Bros. Co.
- 183 W. W. Wallace, Pittsburg, Pa., American Sewer Pipe Co.
- 193 H. B. Green, Philadelphia, Pa., Whitehall Portland Cement Co.
- 210 J. C. Adams, Pittsburg, Pa., D. J. Kennedy & Co.
- 211 D. J. Kennedy, Pittsburg, Pa., D. J. Kennedy Co.
- 218 Geo. M. Kerr, Pittsburg, Pa., Berry Bros.
- 220 C. P. Theiss, Allegheny, Pa., Patterson Coal & Supply Co.
- 223 W. H. Harding, Philadelphia, Pa., Coplay Cement Mfg. Co.
- 224 J. T. Twamley, Philadelphia, Pa., Coplay Cement Mfg. Co.
- 225 Edw. D. Boyer, Catasauqua, Pa., Atlas Portland Cement Co.
- 226 H. J. Seaman, Catasauqua, Pa., Atlas Portland Cement Co.
- 280 Chas. L. Johnson, Pittsburg, Pa., Castalia Portland Cement Co.
- 282 C. B. Nicholson, Pittsburg, Pa., American Lime and Stone Co., of Tyrone, Pa.
- 163 Washington Harder, Philadelphia, Pa., Wm. G. Hartranft Cement Co.
- 286 A. H. Lauman, Pittsburg, Pa., Ohio and Western Lime Co.
- 295 H. S. Miller, Darlington, Pa., Darlington Brick and Mining Co.
- 328 Geo. W. Hackett, Pittsburg, Pa., Castalia Portland Cement Co.
- 160 Geo. N. McAlarney, Wilkesbarre, Pa., Geo. N. McAlarney.

- 208 John A. Strouss, Pittsburg, Pa., Knox, Strouss & Bragdon.
- 28 W. W. Fischer, Memphis, Tenn., Fischer Lime and Cement Co.
- 19 R. W. Marshall, Wheeling, W. Va., Wheeling Wall Plaster Co.
- 115 J. R. Spease, Fairmount, W. Va., Fairmount Wall Plaster Co.
- 116 W. T. Black, Fairmount, W. Va., Fairmount Wall Plaster Co.
- 197 J. B. Arbour, Parkersburg, W. Va., National Plaster & Supply Co.
- 267 L. E. Billson, Wellsburg, W. Va., The S. George Co.
- 26 Edward Bogk, Milwaukee, Wis., Ricketson Mineral Paint Works.
- 35 Chas. Weiler, Milwaukee, Wis., Western Lime and Cement Co.
- 39 Aug. C. Tews, Milwaukee, Wis., Tews Bros.
- 48 T. E. Fleischer, Sheboygan, Wis., Sheboygan Lime Co.
- 133 C. P. Flatley, Green Bay, Wis., Flatley Bros. & Co.
- 102 Wm. H. Pipcorn, Milwaukee, Wis., Pipcorn & Co.

Wisconsin Lumber Dealers' Meeting.

MILWAUKEE, Wis., February 21.—The Wisconsin Retail Lumber Dealers' Association has been in session in this city for the past three days at the Hotel Pfister. This meeting, being the seventeenth annual meeting, was largely attended and many important questions, such as reciprocal demurrage, catalogue houses, etc., were taken up and fully discussed. One of the notable features of the lumber meetings is the fact that so many building material concerns are represented. The lumber dealers, realizing the importance these lines hold and how well they work in conjunction with lumber, are putting in stocks of all kinds of materials. This meeting was especially well attended by the building material fraternity and they were just as generous in entertainment and giving out souvenirs as the wholesale lumber men were. Several had rented parlors on the mezzanine floor and held receptions all day and at night as well.

The U. S. Gypsum Co. had a conspicuous exhibit on the first landing of the stairway, where Messrs. Wicks and Quincy told the dealers all about the products of this company.

The Marquette Cement Manufacturing Co. had a large parlor where they gave out pencils and mirrors. The room was in charge of W. H. Eckles, John Dunlap and Mrs. Dunlap, who is almost as good a cement salesman as John. She was kept busy handing out briquettes, while Mr. Dunlap wrote down orders and he didn't have very much time to do anything else.

The Grand Rapids Plaster Co. had an exhibit in charge of E. N. James where he exhibited the Sackett plaster board to all his visitors.

There never was a minute when there wasn't something doing in the parlor of the Atlas Portland Cement Co., for the hosts here consisting of T. M. Magiff, Fred Clayton and F. C. Bailey always make visitors feel at home.

The Universal Portland Cement Co. was represented by B. H. Raden, who can't keep away from a convention, and H. MacRobert. They held a continuous reception and were busy handing out their latest book on Universal.

Walter Smith, of the Iowa Hard Wall Plaster Co. was one of the most popular men there. There was always some one asking for him for he had a match safe to give away.

J. T. Garland represented the Plymouth Plaster Co. and had a large display of wood fibre plaster and other products, manufactured by that company. He also had samples of sewer tile and a plaster board that the company expects to have on the market soon.

The Gardiff Gypsum Plaster Co. was represented by E. L. Ward, who had a match safe for a souvenir, and was much sought after. Incidentally he placed several large orders for plaster before he left.

W. F. Main, of the Chicago Portland Cement Co., mixed with the delegates.

C. J. Sigwalt, representative of the Wisconsin Portland Cement Co., was on hand to tell the members about the new Badger brand, which will be manufactured at Portage, Wis. Work on the mill and plant will commence soon.

Bert Swett, of Lehigh fame, spent a few days at the meeting.

Col. William Dickinson was on hand the first day to see that things started right at the Marquette room, and also to shake hands with his many friends.

The Exhibits at Columbus.

R. R. Fish was on hand with his water-proofing proposition as usual. He is in his element snowing you how.

The Bath Portland Cement Co., Bath, Pa., showed a lot of briquettes made with their cement of different ages.

Benj. Ives, Chicago, showed his line of concrete veneering blocks made to substitute for clapboards and sidings.

The Alma Cement Co., Wellston, Ohio, had a fine souvenir book for the delegates at their booth.

O. D. Levering, Columbus, Ohio, exhibited wall ties, both galvanized and plain iron, laid on the bricks to show how to use them.

Junction City Sewer Pipe Co., Junction City, Ohio, had a full line of vitrified pipes and blocks. M. M. Roubush was representative.

The Edison Cement Co., Stewartsville, N. J., made a feature of giving away a good paper knife. Mr. Mallory greeted all the visitors with the glad hand.

The Art Portland Cement Co., showed a lot of samples of the Parthenon brand of pure white Portland cement. S. B. Sampson and W. N. Richter composed the reception committee.

Columbus Contractors' Supply Co., Columbus, Ohio, had a case showing two sample walls built of Franklin face brick, one with red and the other with black mortar. Wm. Hunter was in charge.

Hayden Automobile Cement Block Machine Co., Columbus, Ohio, exhibited two sizes of their well known machines. W. M. Scott and George Friel were always on hand.

The Garfy Iron and Steel Co., Cleveland, Ohio, showed their expanded metal fire-proofing and plastering lath; also a full line of Trinidad roofing. Chas. S. Bigsby and Chas. E. Justus were ready to tell all about it.

United States Gypsum Co. had a fine display of signs, calling attention to their exhibit of plaster products on the office floor, where the bird whistled whenever H. F. Dorchester and C. A. Erwin asked him to.

The Whitehall Portland Cement Co., Philadelphia, showed the real "Jim Smith wall," made of miniature concrete blocks, with Whitehall banners to tell the name of the cement. Howard B. Green, the sales manager, and Harry F. Rauch did the honors.

The American Rolling Mill Co., Middletown, Ohio, showed a profusion of their metal lath and fire-proofing goods, both galvanized and japanned, as well as frame containing an example of the practical application of the material with plaster. G. H. Charles was on deck.

The United Cement Machinery Manufacturing Co., Columbus, Ohio, displayed a big banner and John A. McDowell entertained the callers. This concern kept open house over at their big show rooms.

The General Fireproofing Co., Youngstown, O., exhibited a frame with all kinds of re-inforcing material for concrete work, including twisted bars in every useful size, expanded metal for fire-proofing and their original specialty, "herringbone bath." M. E. Murray was in charge and he is a good representative, being put together on a herringbone himself.

The Atlas Portland Cement Co., New York, had a nicely decorated booth where they gave away elegantly cloth bound copies of the celebrated book, "Concrete Construction, about the House and Farm." C. A. Kimball, general sales agent; H. A. Seaman, general superintendent; E. D. Boyer, P. Austin Tomes, Thos. Magiff and Chas. H. Brigham did the honors.

TRADE ETHICS.

(Continued from Page 24.)

everybody's friend—Ed Defebaugh, of Rock Products. Listen to what he says in his December issue:

Prosperity is not Abnormal.

"With the record of a prosperous year behind us, there are sinister prophets who predict in the near future a blighting reaction and a severe falling off in business. The squawking crow that can see bad weather ahead when the sun is shining brightly, goes all unnoticed in the summer time, and his squawk only becomes a prediction when there is going to be a rain or a storm as a natural condition of the season. After all is said about abnormal prosperity, and the statistics are all in and counted, it will be found that the commercial and industrial activities of 1906 do not constitute the record of anything abnormal but only a good business year such as ought to be recorded with each succeeding calendar year, and in a country like ours where the population is growing by leaps and bounds and where in less than half a century a lonesome wilderness has been and is being filled with populous and magnificent cities, the building trades indeed have only just reached the proper normal, and should continue to grow in the years to come into greater and larger things as the population of the cities increases and the natural resources are further developed. Much of this "abnormal prosperity" talk comes from the squawkers who are not remarkable for anything they have accomplished and who subsist like the crow upon the carcass of dead issues."

Now Defebaugh is quite right, of course. A man is a "squawking crow" who goes around predicting hard times because he "feels it in his bones," or "got it from a clairvoyant," or any other inconsequential reason.

But just now there are reasons for the prediction of a panic in 1908 which stick out like a nose-guard on a football player.

The signs of the times are not far to seek. The financial sky is just like the physical sky, subject to the same conditions and derangements. We have had an unusually long and beautiful spell of financial fair weather. The sun is still shining in the financial sky, and bids fair to continue to shine throughout all the fortunate new year. But along the dim horizon any chance observer may clearly see thunder caps rising, and getting blacker and denser daily.

Abhorrent forces surrounding us are steadily pushing these black clouds of distrust, and fear, and hatred, higher and farther, until, within fifteen to eighteen months from now, the sun will be obscured, the winds of destruction will be let loose, and a cyclone of business disaster will sweep our country from the Atlantic to the Pacific.

The immediate cause is the sinister, self-seeking, yellow politician, but the underlying cause is the morbid condition of the public mind.

As a nation, we have worked ourselves into a condition of political hysterics. We listen to every cheap and obscure politician who blatantly shouts that he alone, is an honest man, and every one else is a grafter; and many of us are inclined to believe him, if he only shouts loud enough. We may know that we never have been so prosperous before in all our lives, yet when this yellow cur barks, "You are being robbed by the Trusts! Give me your vote and I will save you," we hurriedly clap our hands on our pocket-books, and swarms of us rush to the polls and vote for him! And the yellow politician hides his sardonic smile as he says to himself, "What fools these mortals be!"

There are creatures in this country who, to gain office, would not hesitate to wreck every business interest surrounding them. They create, in the public mind, artificial classes among the citizens of the only successful Democracy the world has ever seen. Then they instill into the minds of these classes, by unscrupulous lies about "Trusts" which do not, and never did, exist, and, by appeals to envy and all the baser passions of humanity, they cultivate enmity between our own fellow citizens until they succeed in poisoning the public mind away from the old, safe, tried, and true methods of business life.

The natural, the inevitable result of this war upon legitimate business rights, is fast traveling towards its conclusion. Capital will take fright and hide; confidence will disappear; paralysis of business will ensue; banks will break, in-

dustries will close down, armies of unemployed will walk the streets like and hungry—what need to draw the picture! We know it only too well, in all its harrowing features.

And in that day of wrath, the American voter will come to his senses, and he will drag from the high places which they have disgraced, all the yellow pack of political curs who have deceived and beggared him, and he will turn to the old safe, sane, sensible leaders, who once gave us prosperity and stand ready to renew it, and the sun will again break through the clouds, confidence will return, the wheels of business will once more revolve, labor will come into its rightful reward, we will all resume the voyage of life on serene and smiling seas.

I realize that I may be accused of talking politics rather than business, but I care for politics only to the extent that it touches and acts upon our daily life. It is a necessary part of our lives, and reacts and reflects upon so much of our daily affairs, that it becomes to each one of us a daily "trade problem."

If you think this may be "stretching it," let me call your attention to the fact that a resolution is now before the Minnesota legislature looking towards punishment of the "Lumber Trust," for refusing to sell lumber to any one but dealers!

Of course there is no such thing as a "Lumber Trust," any more than there is a "Lime Trust," or a "Cement Trust." In the loose and altogether contemptible way that cheap-skate politicians have of working on the envy and prejudice of the voters, the Retail Lumber Dealers' Association of Minnesota is called a "Lumber Trust" and as such is to be put on trial for its life.

In principle, this attack upon a worthy, honest, and upright institution is nothing less than infamous. The protection of the retail dealer in his retail rights is an ethical necessity, apparent to anyone outside of a lunatic asylum, and the retail dealer who calls upon the policeman to protect him from the midnight burglar, has the same ethical right to call upon organized society to protect him from the distant burglar who robs him of his just earnings and livelihood, in taking away his trade by sneaking and unfair means.

My parting word of caution to you consists of the advice, good in times of prosperity, better in times of adversity, "Put your house in order!" Reduce your indebtedness, accumulate a surplus if you can, watch your credits as carefully as your debits, batten down the hatches of your cargo, close-reef every sail, keep within reasonable distance of a harbor, be prudent. Be prudent.

I thank you for your attention.

Has Had a Good Season.

CLINTON, IND., February 11.—Allen Martin & Co., the well known lumbermen and dealers in builders' supplies, report that they have had a good season, except that during a part of last fall the car shortage interfered to some extent.

Business Was Satisfactory.

ATCHISON, KAN., February 20.—B. L. Brockett, the well known lumberman and dealer in builders' supplies, at 1019 Main Street, says the past season has been satisfactory. Atchison is enjoying quite a building boom and as a consequence the builders' supply men have all been busy.

Had a Prosperous Year.

ST. JOSEPH, MO., February 20.—John W. Bruce, dealer in builders' supplies, at the corner of Sixth and Olive Streets, said that the past season's business had been fully up to his expectations. He said the prospects for the coming season were bright.

The Albany Supply Co., of Albany, N. Y., has been incorporated with a capital stock of \$20,000.00 by R. W. Lee, W. E. Taylor and E. J. Gibbs.

The J. L. Fortado Co., of Springfield, Ill., has been incorporated with a capital stock of \$2,500.00 by J. L. Fortado, E. F. Lomelino and John A. Barber to deal and contract in lime, stone and cement.

The Dunellen Lumber and Stone Co., Dunellen, N. Y., has taken over the business of A. Gray & Co., dealers in builders' supplies in that city. Incorporators are A. Gray, H. S. Garretson and B. K. Burke.

CONVENTION PROCEEDINGS.

Report of Chicago Meeting of the Sand-Lime Brick Association is Continued.

(The first day's session of the third annual convention of the National Association of Manufacturers of Sand-Lime Products, held at the Palmer House, Chicago, December 5, 1906, was published in Rock Products December 22, 1906, and the morning session of December 6 in the January 22, 1907, issue, giving the full text of all the papers of the two sessions, together with a brief summary covering the salient points of the discussion, and according to the agreement with the association, we continue the full report with the afternoon session of December 6, 1906, and in future issues of Rock Products the report will be continued until completed.)

AFTERNOON SESSION, DEC. 6.

President S. K. Squier called the convention to order at 2 o'clock, and nearly all the delegates were in their places. He announced that the convention would now proceed with the program and called for Mr. Moroney's paper and Mr. Hopkins, of the American Sand-Lime Brick Co., responded as follows:

"To those of you who are acquainted with my partner, the genial Mr. Moroney, it will perhaps not be a surprise to know that while he has the knowledge and the literary talent necessary to formulate a paper for this convention, he is by nature such a shy thing that his sensitive soul shrinks from the ordeal of standing up before you and presenting it. He has therefore requested me to be his spokesman in this matter, and it is my excuse for appearing before you to present his paper."

SOME SUGGESTIONS ON PUSHING THE SALE OF SAND-LIME BRICK.

BY J. J. MORONEY.

There is no question in the mind of anyone operating a sand-lime brick plant as to the real merit, strength, beauty and durability of his product. All manufacturers have sincere confidence in the brick, and to successfully push their sale, it is only necessary to impart some of this confidence to the architect, contractor, or owner of the building. The question is as to the best way to do this. The brick themselves will justify his enthusiasm, and will back up any kind of reasonable guarantee, as is shown by the millions of sand-lime brick that have been put in walls during the last four years in this cold northern climate, which is very changeable, and especially hard on building material, owing to the alternate freezing and thawing.

I have a few suggestions to make as to the methods used in pushing the sale of brick, which may be of some value to such of the sand-lime brick manufacturers as have never been connected with the manufacture and sale of clay brick. My only excuse for doing this is that I have been actively connected with the manufacture of fine pressed front brick for the past eighteen years, and am, of course, familiar with the methods employed by the dealers in fine building material, and the manufacturers of high grade dry clay brick, many of whom depend almost entirely on a shipping trade for disposing of their product.

In the first place, it must be remembered that brick never look as well in the pile as they do in the wall. When laid in the wall, only one face, and that the best one, is visible, and the effect of regularity adds greatly to the appearance of the brick, whether sand-lime brick or clay brick. It should therefore be shown to every intending purchaser that it is not a fair proposition to compare a loose pile of sand-lime brick on the yard with a well laid wall made from high grade pressed clay brick. For this reason, it has been found a great advantage in selling sand-lime brick to build a little specimen wall, with white and different colored mortars, in the office or at the works of the manufacturer, where it would be protected from being defaced or marred. The brick show up much better in this way, and are a much fairer comparison with a wall made of clay brick. Of course, where it is possible to show your customer your own brick properly laid in a building, this is an even stronger argument; but it is not always feasible to

take prospective purchasers long distances to show them brick in a wall. Therefore a specimen wall of this kind is always advisable, and especially on new plants.

Another plan that has been found of great assistance, especially in large cities, and where yards depend on shipping trade, is to get a number of boxes, just large enough to hold four brick laid in mortar with different colors of mortar, and using different colored brick so far as possible. After the mortar has set, the brick should be put into the box, and a fancy moulding should be tacked all around the edge of the box, so that it will project a little over the brick. The object of this is to prevent the brick from being taken out of the box, and defaced by handling. The name of the manufacturer should be stenciled on the top of the box, and such sample boxes left in the offices of architects, contractors and building material dealers; or sent by express to small towns where a trade is desired, and exhibited in some prominent store or hotel. This will be found to well repay the time and trouble, and the money invested, as such a box will prove a cheap and effective salesman. Samples put up in this way are practically indestructible; have somewhat the effect of brick laid in the wall, and are very attractive and striking in appearance, especially where there is a decided contrast in the colors of the brick.

Boxes of loose sample brick, such as are often sent out, are not nearly so effective, and the brick are liable to be taken out and defaced by careless handling, thus marring the edges and corners, and soiling the faces, so they are no longer an attractive advertisement. Such loose brick are also subject to all sorts of foolish, unauthorized and experimental tests by ignorant parties, which are prevented by boxing as above.

All tests of sand-lime brick ought to be made under the eye of the manufacturer, who understands the conditions, or according to his instructions, as otherwise, many unfair tests will be made which are unjust to the sand-lime brick. For instance, I have seen parties test a sand-lime brick for absorption by pouring water onto the flat side of the brick; or by immersing it all over in water, and leaving it several hours. I have even seen reports from college professors on sand-lime brick, where absorption tests have been made in the same way. People making such tests will then compare the results with the absorption of clay brick laid in the wall. Of course, no brick laid in the wall is subject to any such conditions, as only one face of the brick is exposed to rains. The manufacturer should always test sand-lime brick in connection with clay brick that he has to come in competition with, and give each the same test. The easiest way to make a fair absorption test is to stand the clay brick and the sand-lime brick on edge on a table, face upwards, and sprinkle water on the faces of each. One of the best absorption tests that I know of was originated by Mr. Smith, of the Memphis Granite Brick Co., with which most of you are familiar. It consists simply in inverting a bottle containing a measured quantity of water on the face of each brick.

A proper and fair test which is made so as to bring the good points of the sand-lime brick to the attention of the customer, is a great aid in selling; but tests made by the ordinary individual who is ignorant of the conditions, is apt to be prejudiced, and makes the test after his own ideas, are usually an injury rather than a benefit, and seldom do justice to the brick. It is therefore better, as above stated, to have as few sample brick as possible lying around loose, so as to be subject to such unauthorized and unjust tests.

Of course, a very great assistance to any manufacturer, and in fact, an indispensable necessity, is the proper printed matter; especially pamphlets showing cuts of buildings erected from his brick, the results of tests on his own brick as compared with clay brick, the opinions of architects and contractors, who have actually used them, and other valuable information, which can be distributed much more widely than it is possible to send samples of the brick. This association could play a very important part in assisting all established factories in disposing of their brick, and in meeting the criticisms and arguments of their competitors in the clay brick industry by establishing a department of "Publicity and Education." The individual manufacturers in such a case should furnish the department with photos of buildings erected from their brick, together with particulars as to the number and kind of brick used, the architects' names, and testimonials; and also with information as to any special instances where objections have been brought up and overcome, or where these brick have been used for any special or new

purpose. In this way a large amount of very valuable information could be collected, which it would be difficult for any one manufacturer to obtain without great expenditure of time and money. This department of the association could then distribute the information so collected to all the plants several times a year, and could also furnish the newspapers with points of general interest that would tend to educate the public as to the merits and use of these brick. Such information coming from the association would have much greater weight and authority than if coming from any individual member, and it pays to advertise in this way.

The very greatest of all aids to the manufacturers in selling their brick will be the education of the public generally on a large scale as to the use and merits of these brick, such as has been done recently by the concrete industry for their own products. In this connection, I might say that the company I represent has just issued a book along the above lines, which is the result of a great deal of individual work, time and money; but any part of the information contained in it is at the disposal of any sand-lime brick manufacturer who wishes to bring out pamphlets for his own trade.

A great deal of criticism has been made of sand-lime brick, which is due solely to the inexperience of the operators of plants in handling, packing and shipping high grade brick. These matters have been brought to a fine point by the makers of pressed clay brick, so that the brick reach the users, sometimes a thousand miles away, in as perfect condition as to the edges corners and faces, as when they came from the kilns. This unfortunately, is true of very few sand-lime brick as yet. Now, it is a fact that a sand-lime brick is a better shipper than a pressed clay brick, and a car contains fewer bats at the end of the journey. It is also a fact, however, that the sand-lime brick generally reach the user in much poorer condition as to edges and corners than clay brick, and this is caused almost entirely by imperfect packing and handling. Most sand-lime brick makers could get some valuable pointers by visiting a high grade clay brick plant, and becoming familiar with their methods of shipping and handling front brick. I have myself seen sand-lime brick on the yard, where the edges and corners were practically perfect, and the brick were high grade in every respect, and then have seen the same brick delivered on a job, battered and defaced, with edges and corners broken, which put them into the common brick class. All sand-lime brick should be handled with a brick lifter from the car to the sorting shed or freight car, and again from the freight cars to the wagon, and from the wagon to the job. All pressed brick in Chicago are handled in this way, and are carefully packed with hay, both on the cars and wagons. They are never tossed or dumped. I have myself seen sand-lime brick that were intended for outside finishing work dumped from the end of a dump cart in a pile.

Most of the sand-lime brick plants would be greatly benefited by paying much more attention to the methods of shipment than they do, and also by sending out samples in a more careful manner. I have known a number of instances where sample sand-lime brick were sent to the dealers to compete with pressed clay brick on a job for face work, and were sent in a barrel or box, without any packing whatever. Now the pressed clay brick manufacturers are very particular in packing their sample brick, which are shipped almost as carefully as china. They figure that the first impression made on the man opening the box is a lasting one, and perfect edges and corners have a great deal to do with the impression made.

When all is said and done, however, the thing that will be decisive in selling sand-lime brick is the excellence of the brick themselves. If a man makes a better brick than his competitors, it is only a question of time when he will get the bulk of the business in his locality. The few hints on selling above given, however, may perhaps enable some manufacturers to arrive at this point more quickly.

Mr. Isenberg: In support of one remark the gentleman made in this paper I want to say that I have tried and found satisfactory the results from having little samples of a wall built of brick from the plant, with several different colored mortars, as a display or example of the effect of the brick when laid in the wall. The little displays of this kind arranged in my office have been the means of my company selling not less than 500,000 brick. I have also employed the suggestion con-

tained in the paper with regard to comparative absorption tests with high class clay brick. The brick that I sold for the theater job in Altoona already mentioned were tested surreptitiously by the builder. He tried them for absorption, for hardness or crushing strength and for fire test; and, at the end of his own investigation came voluntarily and gave me an order for 700,000 brick. About three months after the theater was completed, it burnt out so that the inside structural members were completely destroyed. A careful investigation was instituted by the mayor of the city, who appointed a committee of six disinterested people, two of whom were noted architects, the other four contractors and builders. They were given instructions to make a critical examination and report even the slightest fault that might be found in the walls. This committee, after spending a whole day on the building and examining every part of it carefully, came back with the report in these few words: "We find no fault in the condition of the walls of this theatre building, we could not build a better wall."

Mr. King: I had a little experience with building an opera house myself. We had induced a builder to use sand-lime brick and had begun to deliver the brick at the job, when he came to me and said: "I have been interviewed by a number of brick men who argued that the building is liable to fall down after it is completed." I promptly offered and did give bond in the sum of \$15,000.00 and the brick went into the building. That builder now contemplates putting on another story to the building; and, he told me recently: "Your bond is never going to bother you; I am satisfied that I have the best wall there is in town and I am going to build the rest of it out of sand-lime brick."

The President: There is no doubt that it does pay to display sand-lime brick and display them well. In our office we have about one hundred panels and I found that these have a marked effect upon men as well as women. "I don't like that brick at all," is the verdict, then he walks down to the other end, sees the same brick set up in mortar and says, "That is what I want," and takes it. I will now call on Dr. Lazell for his paper.

REPORT OF OFFICIAL TEST.

BY E. W. LAZELL, PH. D.

At your last meeting in Detroit, I gave you a talk more particularly on the chemistry and manufacture of sand-lime bricks. In this paper I will take up some of the physical properties of this material.

Sometime after your last meeting, your secretary, Mr. H. O. Duerr, requested the various members of the association to send him samples of their bricks, together with a sample of the sand, the lime and the mixture used; it was our intention to investigate all these materials thoroughly and we hoped to be able to present to you, at this meeting, data from which valuable conclusions could be drawn. Unfortunately, the response, to the request was not as general as we wished, only some fifteen members submitting samples, and, in a number of cases, these were not as complete as we desired. We further hoped to develop from the physical tests of the bricks both standard methods of testing and standard specifications for the bricks; this later point I will take up more fully later on.

Something over one hundred bricks were received, and on all of these the following tests were made: Transverse test (including modulus of rupture), compression test, absorption test, compression after absorption (this latter test being made on bricks saturated with water).

In the samples of mixture submitted, the fineness of the material was determined and also its chemical composition. The following tables give the results in detail, and, I trust, that you will find them worthy of study.

By referring to the tables you will find that:

The average modulus of rupture obtained was 446 pounds.

The average compression strength in pounds per square inch was 2,922.

The average absorption was 15.16 per cent.

The average compression strength in pounds per square inch when the bricks were saturated with water was 1,961, which shows a loss of 32.88 per cent from their strength when dry.

These tests include over one hundred bricks received from fifteen different factories. Only five lots pass the requirements for the full test, six

TABLE #1.

Physical Properties of Sand-Lime-Bricks.

Lab. No.	No. of Bricks tested.	WEIGHT DRY		TRANSVERSE TEST						ABSORPTION TEST			COMPRESSION TEST			Loss %	
		Brick	per sq-in.	Size Inches	Pounds			Lbs. per sq-in.			Per Cent			Lbs. per sq-in.			
					Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.		Min.
42670	1	.....	.....	8.25x4.00x2.25	363	...	...	2216	.....	.....	21.68	.....	..	1710	...	...	22.85
42640	2	.....	.....	8.25x4.00x2.25	435	456	414	2973	3160	2787	13.04	.....	..	1770	1650	1690	40.46
44940	6	75.061	1.054	8.20x4.00x2.17	440	528	346	2654	3269	1876	16.02	16.37	13.02	1804	2024	1232	32.02
42760	2	76.331	1.028	8.25x4.00x2.25	494	549	420	3019	3908	2130	12.09	14.10	11.80	2156	2686	1626	28.58
42810	7	86.506	1.118	8.25x4.00x2.40	480	555	401	3771	4464	3164	12.34	15.31	11.40	2205	2464	1981	41.82
44580	8	79.048	1.006	8.36x4.00x2.35	428	530	378	2655	3645	1935	14.86	16.89	13.26	2407	2671	2034	9.34
44650	8	80.282	1.008	8.45x4.10x2.30	475	601	357	2996	3973	2379	16.57	17.44	10.16	1960	2740	1516	52.84
44840	7	76.860	.970	8.25x4.00x2.40	377	410	319	2516	2951	2414	14.49	14.82	14.13	1662	1914	1710	19.60
42680	1	.....	.....	8.25x4.00x2.25	492	...	...	4278	.....	.....	16.38	.....	.....	2920	.....	.....	32.07
42660	3	.....	.....	8.50x4.125x2.5	401	480	346	2801	3731	2222	18.34	.....	.....	1847	2260	1640	34.05
44600	7	76.684	.974	8.20x4.00x2.40	306	350	227	2435	2947	1864	15.47	16.33	14.44	1521	1922	1239	37.58
42760	4	71.559	1.038	8.06x3.71x2.31	612	846	400	3623	4502	2300	13.90	14.40	12.60	2260	2804	1277	36.86
44620	8	79.448	1.074	8.30x4.00x2.20	407	479	367	2545	3187	1968	13.72	15.11	12.09	2069	2445	1719	16.70
44756	8	72.735	.974	8.25x4.00x2.25	336	399	264	2611	2802	1980	15.53	16.80	13.95	1735	2082	1445	30.90
42820	1	81.340	1.040	8.25x4.00x2.37	595	...	...	2981	.....	.....	16.34	.....	.....	1147	.....	...	61.52
46060	10	76.695	.995	8.40x4.00x2.30	512	625	392	3082	3613	2579	14.89	17.16	12.90	2008	2376	1711	34.82
Ave	.....	.....	1.023	.....	446	.....	.....	2922	.....	.....	15.16	.....	.....	1961	.....	.....	32.06

pass the requirements of the compression strength, and seven the requirements of the absorption test; the requirements referred to are those of the Bureau of Buildings, Borough of Manhattan, New York. To pass these regulations the following requirements must be met:

The modulus of rupture must average 450 pounds and must not fall below 350 pounds in any case.

The ultimate compressive strength must average 3,000 pounds per square inch and must not fall below 2,500 pounds in any case.

Percentage of absorption (being the weight of water absorbed divided by the weight of the dry sample) must not average higher than 15 per cent and must not exceed 20 per cent in any case.

The reduction of compressive strength by saturating with water must be no more than 33 1/2 per cent except when the lower figure is still above 3,000 pounds per square inch, the loss in strength may be neglected.

The specifications further require that the bricks be submitted to the freezing and fire test. These tests were not made on samples submitted owing to the time and expenses required to complete the test.

The modulus of rupture referred to is calculated according to the formula $R = \frac{3Wl}{2bd^2}$ where W is the

load applied at failure of specimen, l is the distance between supports, 7 inches, b is the breadth of the specimen, d is the depth of the specimen. In this test the brick is supported flatwise on rounded knife edges, 7 inches apart and the load applied on top midway between the supports.

The results may appear somewhat discouraging but they are no worse than was to be expected, and compare well with those obtained from common clay bricks.

It appears to me, however, that your aim should be to make a product which will at least meet the requirements of the specifications given above, and it is only by doing so that you can expect sand-lime brick to meet with the warm reception they deserve.

Taking up now the samples of mixture submitted which were supposed to represent the material used by each manufacturer as it went to the press, these by chemical analysis gave the following results:

Average per cent of sand 88.51
Average per cent of alumina and iron oxide.. 1.17
Average per cent of lime 6.46
Average per cent of magnesium53
Average per cent of loss on ignition 3.71

You will note that there is little variation in the amount of lime used in the mixture, as the lowest amount found in any one was 4.6 per cent, while the largest amount found was 18.94 per cent. This latter mixture, however, was abnormal, since the sand used contained over 34 per cent of carbonates; this accounts for the large amount of lime found in the mixture. The next highest result obtained

was 9.94 per cent of lime which can be considered as the maximum amount.

Chemical Composition of Mixture.							
Lab. #	Sand	Alumina & Iron Oxide Al ₂ O ₃ -Fe ₂ O ₃	Lime CaO	Magnesia MgO	Loss on ignition	Pressure used in hardening cylinder	Time in hardening cylinder
42670	82.54	1.44	9.94	.71	5.72	1305	10
42640	91.98	.39	4.91	.25	2.96	120	12
42810	55.36	1.68	18.94	5.11	19.28	120	8
44580	.....	.....	.....	.....	.....	150	..
44840	89.96	.84	6.14	.42	2.86	125	10
44860	89.44	.82	6.22	.46	4.10	120	10
42650	.....	.....	.....	.....	.....	125	14
42660	85.92	2.04	6.94	.98	4.24	120	10
44600	91.24	1.48	4.60	.36	2.40	120	11
42760	.....	.....	.....	.....	.....	130	10
44620	.....	.....	.....	.....	.....	115	..
44750	.....	.....	.....	.....	.....	120	..
Ave.	88.61	1.17	6.46	.53	3.71	122	10

TABLE No. 3.

The average fineness of the mixture was as follows:

Per cent passing 20 mesh sieve 95.5
Per cent passing 30 mesh sieve 91.0
Per cent passing 40 mesh sieve 82.7
Per cent passing 50 mesh sieve 66.2
Per cent passing 60 mesh sieve 51.2
Per cent passing 80 mesh sieve 28.3
Per cent passing 100 mesh sieve 20.6

The variations as to fineness are very great as to the amount of material which passed the 100 mesh sieve; the highest result obtained was 32 per cent and the lowest 1.7 per cent.

It has often been stated that the finer the material in the brick, the greater its density and strength, this, however, is a fallacy, as the tests show that bricks containing excessive amounts of fine material as well as those containing excessive amounts of coarse material failed to meet the requirements. The reason for this was taken up in detail in my address of last year.

In order to introduce the greatest amount of material into a given space, the material should be graded so that the fine portions of it exactly fill the voids between the coarser particles. You should therefore aim to determine, by direct experiment, exactly the amount of fine material required to give you the above results. The lime should be considered as fine sand.

Taking up the hardening of the bricks, it was found that the average pressure used in the hardening cylinder was 125 pounds and the average time was ten hours. The highest pressure used by any one manufacturer was 150 pounds and the lowest 115 pounds. The longest time the bricks were exposed to the hardening action in the cylinder was 14 hours, and the shortest time was eight hours.

In none of the mixtures examined was any material amount of magnesia found, in all cases less than 1 per cent and in most cases less than one-half of one per cent.

I regret very much that more members did not submit samples in order that the results obtained could not have covered a larger field and hence have been more conclusive. It is, however, clearly shown that more care must be taken in the manufacture of the bricks if you wish to produce a product which will demand a good price and compete with those in its class. This can, in most cases, be accomplished with very little additional expense, requiring only a more careful oversight of the materials themselves and the method of manufacture. Each manufacturer should watch both his sand and his lime to see that their character remains constant and uniform; more careful attention should be given to the proportion of the materials to be sure that the requisite amount of fine sand is obtained, that the lime is thoroughly hydrated, the mixture is properly proportioned and then thoroughly mixed. I am convinced that as much more care should be taken in the preparation of the mixture from which sand-lime bricks are to be made as is taken by the manufacturer of cement in preparing his mixture. Further, sufficient pressure should be given the product to thoroughly compact it and the press should not be run at too high a speed, since the material is not plastic and it requires sometime to adjust itself under the pressure.

If these points are carefully carried out, I am of the opinion that a good sand-lime brick can be made by any of the so-called methods of manufacture and that there will be no trouble in disposing of the product.

As a member of your Committee on Uniform Tests and Specifications for sand-lime bricks I would recommend to your association that you adopt the specifications and method of testing as at present used both in New York and Philadelphia; the requirements are not excessive and can be readily met. If this is done you can be assured of producing a first class product and one that will withstand the test of time.

I wish to report to you now an interesting development noticed in the course of testing a great many sand-lime bricks; when the bricks were subjected to the transverse test they did not all break squarely in the middle, the uneven breaks being more common than the square ones. The only explanation which occurred to me was that there must exist a difference in strength between the two halves of the brick.

During a conversation with Prof. Woolson, of Columbia University at Atlantic City, he stated that it had been suggested to him by a practical brick manufacturer that owing to the molds of the vertical press being filled from one end there might be more material in one end of the brick than in the other; if this be true, the end containing the most material would receive the greater pressure and would be denser and stronger. It was in order to confirm or disapprove this that the tests which I will give were undertaken.

Fineness of Mixture Sieves							
Lab. No.	#60	#80	#100	#120	#140	#160	#180
42670	96.75	91.6	80.0	61.7	50.4	38.6	32.5
42640	99.00	90.2	72.1	44.9	29.7	12.9	7.2
42810	86.25	77.8	67.0	53.5	42.3	29.4	25.1
44580	97.20	94.9	90.2	79.8	64.3	37.6	29.3
44840	95.00	93.1	88.2	65.3	40.3	5.4	1.7
42650	97.75	92.7	83.1	60.1	43.5	19.5	13.5
42660	95.40	94.6	93.3	87.1	75.5	45.0	26.6
44600	96.70	93.2	88.0	77.3	63.7	42.4	28.9
Ave.	95.50	91.0	82.7	66.2	51.2	29.8	20.6

TABLE No. 2.

Some bricks were obtained from a manufacturer which were made on a vertical press and the front end of these bricks was marked with an "X" before it was removed from the press; these bricks were then hardened in the regular manner and tested first by cross breaking and then each half for compression.

The first lot obtained consisted of ten bricks, these gave an average modulus of rupture of 712 pounds; the half with the "X" (or the front half of the brick) gave an average compressive strength of 3,161 pounds per square inch; the back half, or unmarked half, gave an average compressive strength of 3,527 pounds per square inch. The difference between the two halves was 366 pounds per square inch.

TABLE No. 4.—COMPARISON BETWEEN THE COMPRESSIVE STRENGTH OF TWO HALVES OF SAME BRICK—TRANSVERSE TEST.

Mark	Weight, grams	Size, inches	Failed at	Modulus
44250	2230	8.30 x 4.00 x 2.30	1870	927
1	2205	8.30 x 4.00 x 2.30	1640	813
2	2179	8.30 x 4.00 x 2.30	1060	574
3	2158	8.30 x 4.00 x 2.30	1240	615
4	2229	8.30 x 4.00 x 2.30	1230	620
5	2227	8.30 x 4.00 x 2.30	1450	719
6	2196	8.30 x 4.00 x 2.30	1530	769
7	2228	8.30 x 4.00 x 2.30	1200	595
8	2229	8.30 x 4.00 x 2.30	1400	759
9	2227	8.30 x 4.00 x 2.30	1470	729
Av.	2214			712

COMPRESSION TESTS ON BOTH HALVES OF ABOVE BRICK.

Unmarked half or back half.					Marked half or front half.				
Mark	Size	Area	Failed per sq. in.	Lib. per sq. in.	Mark	Size	Area	Failed per sq. in.	Lib. per sq. in.
44250	4"x 4.5"	16.0	71950	5999	4"x 4.5"	16.0	50650	3728	377
1	4"x 4.5"	16.0	58850	3680	4"x 4.5"	16.0	58850	3679	-193
2	4"x 4.5"	17.2	59350	3450	4"x 4.5"	16.0	47500	2968	-692
3	4"x 4.5"	17.2	56070	3258	4"x 4.5"	16.0	44150	2760	-369
4	4"x 4.5"	17.0	63740	3749	4"x 4.5"	16.0	53890	3368	-380
5	4"x 4.5"	16.4	54970	3355	4"x 4.5"	16.4	49480	3015	-336
6	4"x 4.5"	16.4	58700	3579	4"x 4.5"	16.0	46600	2917	-562
7	4"x 4.5"	16.0	50620	3162	4"x 4.5"	16.0	57320	3586	-234
8	4"x 4.5"	17.2	59500	3461	4"x 4.5"	16.0	47960	2997	-444
9	4"x 4.5"	17.6	59040	3354	4"x 4.5"	15.2	43320	2850	-504
Av.			59327		Av.		48118		

In order to further confirm these results a second lot of bricks was obtained from the same manufacturer and marked in the same manner. At the same time a lot of bricks was obtained which were made on a rotary press and the outside end of each brick was marked; these were then tested with the following results:

Lot No. 2. Bricks made on the vertical press:

Average modulus of rupture, 596 pounds.

Average compressive strength of front or marked half of brick, 3,759 pounds.

Average compressive strength of back or unmarked half of brick, 3,759 pounds.

Difference between the two halves of 316 pounds.

This shows clearly that the method of filling the mold with the vertical press influences the strength of the brick.

TABLE No. 5.—COMPARISON BETWEEN COMPRESSIVE STRENGTH OF TWO HALVES OF SAME BRICK. LOT No. 2. TRANSVERSE TEST.

Mark	Weight, Grams	Size, inches	Failed at	Modulus
44240	2141	8.25x4.10 x2.25	1360	627
1	1988	8.25x4.00 x2.20	1110	492
2	2039	8.25x4.00 x2.25	1130	518
3	2070	8.25x4.00 x2.25	1010	523
4	2027	8.25x4.00 x2.25	1210	567
5	2012	8.25x4.00 x2.25	1090	503
6	2054	8.25x4.00 x2.25	1010	523
7	2133	8.25x4.10 x2.25	1280	617
8	1964	8.25x4.00 x2.20	1300	703
9	2009	8.25x4.00 x2.25	1150	539
Av.	2041			596

COMPRESSION TEST ON BOTH HALVES OF ABOVE BRICK.

Unmarked half or back half.					Marked half or front half.				
Mark	Size	Area	Failed per sq. in.	Lib. per sq. in.	Mark	Size	Area	Failed per sq. in.	Lib. per sq. in.
44240	4.1"x4.7"	15.2	60120	4784	4.1"x4.9"	16.0	67580	5463	-679
1	4.1"x4.9"	15.2	48530	3789	4.1"x4.9"	16.0	54460	4366	-12
2	4.1"x4.9"	16.0	67740	5374	4.1"x4.9"	16.0	60180	4779	302
3	4.1"x4.9"	16.0	60140	4766	4.1"x4.9"	16.0	50440	4038	-628
4	4.1"x4.9"	16.4	72030	5664	4.1"x4.9"	16.0	50000	3971	-245
5	4.1"x4.9"	16.4	64970	5193	4.1"x4.9"	16.4	48050	3680	-410
6	4.1"x4.9"	16.0	67130	5278	4.1"x4.9"	16.8	49870	3980	-130
7	4.1"x4.9"	16.0	50240	4017	4.1"x4.9"	15.2	59300	4714	-547
8	4.1"x4.9"	16.0	66970	5275	4.1"x4.9"	15.0	58800	4664	11
9	4.1"x4.9"	17.2	61770	5001	4.1"x4.9"	15.0	49580	3968	-191
Av.			59759		Av.		47403		-191

Lot No. 3. Bricks made on the rotary press:

Average modulus of rupture, 778 pounds.

Average compressive strength of outside half, or marked half of brick, 4,266 pounds.

Average compressive strength of inside, or unmarked half of brick, 4,514 pounds.

Difference between the two halves of 248 pounds.

In this case too, it would appear that the method of filling influences the amount of material in the two ends of the brick, hence its strength.

TABLE No. 6.—COMPARISON BETWEEN COMPRESSIVE STRENGTH OF TWO HALVES OF SAME BRICK MADE ON ROTARY PRESS. TRANSVERSE TEST.

Mark	Weight, grams	Size, inches	Failed at	Modulus
44730	2208	8.30x4.00x2.30	1660	911
1	2175	8.30x4.00x2.30	1400	758
2	2258	8.30x4.00x2.30	1780	884
3	2268	8.30x4.00x2.30	1480	792
4	2258	8.30x4.00x2.30	1840	913
5	2259	8.30x4.00x2.30	1770	890
6	2235	8.30x4.00x2.30	1470	794
7	2257	8.30x4.00x2.30	1810	894
8	2242	8.30x4.00x2.30	1880	904
9	2254	8.30x4.00x2.30	1740	867
Av.	2248			778

COMPRESSION TEST ON BOTH HALVES OF ABOVE BRICKS.

Unmarked half or inside half.					Marked half or outside half.				
Mark	Size, in.	Area, sq. in.	Failed per sq. in.	Lib. per sq. in.	Mark	Size, in.	Area, sq. in.	Failed per sq. in.	Lib. per sq. in.
44730	4"x4.5"	16.0	98700	6169	4"x4.5"	16.4	67780	4129	-976
1	4"x4.5"	16.0	73100	4566	4"x4.5"	16.6	66530	4009	-489
2	4"x4.5"	16.4	90280	5509	4"x4.5"	16.4	66400	4042	-467
3	4"x4.5"	16.4	78900	4872	4"x4.5"	16.4	74490	4539	-1006
4	4"x4.5"	16.0	90380	5649					
5	4"x4.5"	16.0	85110	5319	4"x4.5"	16.6	78010	4756	-208
6	4"x4.5"	16.0	74210	4639	4"x4.5"	16.0	71700	4448	-55
7	4"x4.5"	16.4	85820	5233	4"x4.5"	16.4	54880	3343	-709
8	4"x4.5"	16.0	81020	5064	4"x4.5"	16.4	58000	3537	-431
9	4"x4.5"	16.4	80340	4900	4"x4.5"	16.4	51810	3157	-214
Av.			81814		Av.		47403		-740

It is generally the custom in testing bricks to use for the compressive test the half bricks resulting from the transverse test. If also the absorption and compression tests of the bricks when saturated are to be made, care should be taken that equal numbers of the larger and smaller pieces of the brick are taken for the test, otherwise, owing to the smaller half being the weaker, abnormal results would be obtained.

You will further notice from the results given that the bricks made on the single mold rotary press are stronger than those made on the vertical press. The results also show that the bricks made on the rotary press are denser.

I would conclude from the above results that a more uniform method of filling the molds in both the vertical and rotary press should be devised and, if possible, the bricks should receive either a blow or initial pressure before the final pressure is put on in order that the corners and ends of the mold be evenly filled. This, it appears to me, is a problem which should be taken up by the manufacturers of machinery.

I am further fully convinced both from the results of tests and from my experience with the manufacture of sand-lime brick that better and more uniform bricks can be made by using a single mold press, since if some method of filling

the molds is devised which gives an equal amount each time, the bricks will then receive absolutely a uniform pressure.

Upon motion of Mr. Jackson and Mr. Plummer a vote of thanks was passed to Dr. Lazell, with a resolution to pay his expenses for attending the meeting.

Mr. Duerr reviewed Dr. Lazell's paper briefly and remarked that only statements based upon such reliable information should be made about sand-lime brick. He said that he knew of a great many superficial tests made by the various manufacturers upon which unreliable statements and wild claims have been made. He briefly reviewed the methods of his concern with regard to the reliability of testing and the progress he has made in the improvement of his product.

Mr. Bovy: How our product may be improved is of interest to us all, and the remark just made by the secretary suggest that he has found a way to greatly improve his product. We would like to know how he accomplished this and get his valuable suggestions.

Mr. Palmer: I understand that Mr. Duerr has changed his process and also has added a grinder of some sort to his plant. I would like to know whether your improvement has been accomplished principally through your press or by this grinder in pulverizing your material.

Mr. Plummer: It seems to me if Mr. Duerr would state in a general way what he did, it would give us a clear idea.

Mr. Duerr: The improvement accomplished in our brick was brought about both by introducing grinding machinery and also in changing the material. I found that the sand I was using had not enough filler of fine sand and old brick together. The finest sand I had would not pass 100 mesh. I made a number of experiments and found that by introducing some finely ground sand that would pass 100 mesh that the brick so made were 25 per cent stronger. I followed out Dr. Lazell's suggestion of determining what would be the right amount of fine sand that I should have in my brick for the material which I was working with, and I found that 16 to 20 per cent was the right limit. I then ground that percentage of sand with my lime and I found that it increased the strength of my brick nearly 50 per cent. I think that practically all the strength that we get in our brick is due to that portion of the sand which will pass the 100 mesh sieve. All the other sand is nothing more or less than filler. The fine sand combines with the lime and makes the cement binder.

Mr. Hopkins: I would like to know why a brick made of all fine material would not be stronger than one made of coarse sand mixed with fine.

Mr. Duerr: Because you are not doing just what Dr. Lazell suggested we should do. That is, we should get the most material into the mold that we possibly can. There are just as many voids in a sand all of which is 100-mesh fine as in a coarse sand.

Mr. Ransome: In regard to the number of voids that would depend upon the uniformity of your coarse material. If you had a coarse material that was entirely uniform your voids that is the actual space in the voids would be greater, but with the fine material you would have more surface because your voids are smaller as each one of the voids is smaller, yet they don't foot up any more than they would in the case of larger grains. In all cases where you have the larger grain sand you have not that degree of uniformity, you have more or less irregularity in size, and for this reason they do, mesh in. In regard to the relative strength of your brick made of fine sand and of coarser sand mixed with fine sand, I would say that where you have a very fine sand and sufficient lime to combine with nearly all of it, you have very little sand left in the free state, and the combination itself is not as strong as the silica of the sand. That will not stand the crushing test. If you have a brick made up of coarse sand together with a sufficient bond that will hold all the grains together you have the ultimate strength, the same as you do in the cement mixture. If you made a brick entirely of neat cement you have not as strong a body as you have if you use a material as an admixture (like sand) that is stronger than the cement itself.

Mr. Hopkins: I quite agree with the gentleman, the manner in which Mr. Duerr made the remark was what prompted my question. I determined long ago by careful experimentation that

If we added 25 per cent of sand finer than 100 mesh we got with our sand in its natural shape the very best and strongest brick that we could make. When we used 50 per cent of the very fine material it showed less absorption and also less strength; when we tried 75 per cent of the fine material there was practically no absorption but the modulus of rupture was still lower.

Mr. Bovy: I forget the proportions of sand Dr. Lazell stated that would give the best results.

Dr. Lazell: Last year I gave an illustration of the proportions and drew it out graphically with circles, you will find it in the proceedings of the Detroit convention. Mr. Duerr was perfectly correct in stating that probably the only part of the sand that enters into the bond with the lime is much finer than that passing the 100-mesh sieve. If you could imagine it as fine as that passing a 1,000-mesh sieve. Your material is only in the cylinder a few hours, the lime and the sand are only in contact on the outside, and the more surface you have in contact the quicker the re-action goes. I tried one pat exposed to the action of steam for seventy-two hours where 15 per cent of the silica was acted upon, and that is how I came to the figures on theoretical action of lime upon sand. Dr. Michaelis has written an article on the constitution of Portland cement, which is about a page in length that every sand-lime brick manufacturer ought to read, because it is about sand-lime brick.

We have made a number of experiments on brick. When you heat a brick on all sides, put it in an oven and raise your temperature high, you lose all the strength of the brick, but that is not the way fire acts. Fire hits the brick on one side. Probably in no conflagration did the heat ever penetrate for more than two or three inches into the wall; so if the material will not spall or crack off under fire, it would destroy only a little of the outside of your brick. Lime is a very poor conductor of heat. You burn part of your lime back to quicklime, that acts as a protecting coating; and every brick that has been through a real fire test has only been damaged materially on its outer edge. If that is correct, it is due to contraction and expansion; and the water may contract them by contracting quickly. They stand for all practical purposes—sand-lime brick, for all practical purposes, stand just exactly as well as the very best clay brick. I would not recommend them for the lining of the fire kiln where the temperature is up to 2,500 to 3,000 degrees. They contain too much lime for that.

R. C. Penfield: How can the manufacturer determine just how much fine material he would require? It has just occurred to me that if each manufacturer could determine the percentage of fine material that was required simply and easily, that then it would be up to him to apply the necessary fine material up to that percentage, whatever it might be. If you take sand perfectly dry and put it into a measured receptacle so that you know just how much there is, could you not take water and determine the percentage of voids by applying known quantities of water to it until it would take no more water? If this is the case why couldn't anyone determine the percentage of voids with these simple facilities for measuring the sand and the amount of water that he puts in? If he requires 20 per cent of fine material, put it up in that way, and make these elegant brick with 850 pounds crushing strength.

Dr. Lazell: Perfectly correct. The determination is made exactly that way, only you have to be very careful to get your air out. If you want my suggestion: I would say, get a one-mold press that you can experiment with, determine the voids in the sand and start with that as the maximum amount of fine sand. Make up some bricks, 100 of them. Buy a little cross-breaking machine, which costs only about \$100.00 and test these brick. It is certain that not more than one per cent of the bricks that fall will show a good cross-breaking strength, meaning that this stands for every other test. This would mean perhaps an expenditure of \$300.00 to \$350.00 to the manufacturer for apparatus to conduct his own experiments.

Mr. Ransome: I have made some experiments with sand passing 150-mesh screen. In regard to its carrying qualities as a cement, mixing it with lime, I took some limestone screenings as an inert material for my filling, then used half and half of this fine sand and lime (mixing them thoroughly first) and used that in about the same proportions, that they do in the concrete work, and I made a brick that was harder than the average sand-lime brick.

Mr. Carl: I would like to ask how many manufacturers use cement with their sand-lime brick.

Down at Marion, Ohio, we could not sell the brick if we didn't tell the customer that we had cement in them.

The President: Is there any one here who will get up and say he uses cement in making sand-lime brick?

Mr. Elcus: We use from 1 to 5 per cent of cement in our brick. We have made a brick from sand and lime that will stand a crushing strength of from 3,000 to 4,000 pounds. We found that we could get 1,500 pounds more by putting in 3 per cent of cement, and the brick has gained in crushing strength by the use of still more cement—up to about 5 per cent.

Mr. Palmer: The Committee on Membership request any members who have not paid the \$30.00 assessment to meet the committee before their report is presented to the convention.

Mr. King suggested that in order to adjourn by 1 o'clock tomorrow that the session be called at 9 o'clock, and on motion of Mr. Jackson this was passed.

The President: I am going to ask Mr. Anderson if he will be good enough to read his paper now.

INSURANCE.

L. S. ANDERSON, JACKSON, MICH.

Mr. President and Gentlemen of the Convention: The subject of insurance is one, as to its cost and reliability, that is of interest to nearly all the members of our association. In our correspondence, we found some who are so fortunate as to have plants in which there is "nothing to burn," who do not need it, but the problem of getting good insurance at reasonable rates appeals to most of us. It has been the experience of so many that underwriters do not recognize the difference in risk, between our factories and clay or shale plants, with kilns and driers, that at the convention last year, a committee was appointed to canvass the matter. At first, the only way of getting relief from rates that in many cases were exorbitant and unreasonable, seemed to be through mutual insurance, and we procured the constitutions of two or three mutual chartered companies which are doing well for their patrons, and saving them money. The Lumbermen's Mutual Insurance Co., of St. Louis, Mo., offered to admit us to membership, on equal terms. Their basis of business is payment annually of the regular local rates, and a refund at the end of the year, of the amount remaining unexpended, usually about one-third of the premium. One objection to this seemed to be the great hazard of lumber plants, as compared with sand-lime brick plants. A plan of organization was outlined to us, by one of the best corporation lawyers in Pennsylvania, which would require simply the co-operation of ten members, to be all residents of one state, but with any additional membership, and from as many other states as desired, which, he stated, would conform to all laws, and if the insured parties solicited the insurance, instead of insurance company soliciting the business, could do business in all the states.

To ascertain the minds of those who were or might become members of the association, a circular letter was prepared, and sent to every company whose address was given by the Secretary of the Interior, as being manufacturers of sand-lime brick, together with other names on Mr. Duerr's list, about 140 in all.*

Eight or ten came back as "uncalled for." Of replies received, seven stated that they considered the rates fair, some of whom would have saved nearly half of their premiums by insuring through Samuels, Cornwall and Stevens, if enough companies had availed themselves of the arrangements made with them, to put our plan into operation. Five were strongly opposed to any mutual plan of insurance. Thirty favored the co-operative plan and proposed, if properly organized and safeguarded, to take insurance amounting to \$437,000.00. Thirty-two favored the plan of insuring through brokers, to the extent of \$481,500.00. Over half of those to whom the circular letters were sent did not reply.

As the other members of the committee could not meet the brokers representing the companies referred to in the circular, I arranged to have Mr. Duerr meet them with me, and an agreement was entered into, by which the three companies which joined in it, were to insure brick plants at 1½, and wooden construction at 1¼ per cent, with premium of ¼ per cent for hydrant protection, and penalties of ¼ per cent each for boiler without fire wall separating from main building, lime not hydrated, stored in main building, and failure to provide fire pails at convenient points.**

To show what this arrangement would be worth to the association, I found the amounts carried by the companies replying, at rates charged, cost \$15,286.30, while under our agreement, the cost will be \$8,860.00, effecting a saving of \$6,426.30.

Up to the time of the San Francisco fire, so few had taken steps to avail themselves of the offer of the companies, that the matter was dropped.

A Presbyterian deacon whose church had just built a handsome and costly edifice, which acoustically, and in the matter of heating and ventilation, was a disastrous failure, said to the writer, that he was "praying for a good, honest fire." The feeling that there are a good many sand lime brick companies which still have the balance, in brick account, on the wrong side of the ledger, and whose stockholders might feel somewhat like the deacon, is at the bottom of most of the objections to a mutual company, which is wholly composed of manufacturers of sand-lime brick. This feeling is so strong, and has so much foundation in existing conditions, that it is probable that the time has not arrived when such a company could be successfully launched, but we believe that it will not be long before the companies which have been started (as numbers have) by men with no knowledge of the brick business, where conditions were such as to make success impossible, will be eliminated, and the remaining companies, with many new ones, will be established on a permanently successful basis, and that then we will find it to our interest to do our own insuring.

*A copy of this circular was sent out to all the manufacturers, who can refer to it from their files.

**Letters embodying this plan were sent out to members of the association and to non-members by the secretary and Mr. Anderson under date of March 8, 1906.

R. C. Penfield: I move a hearty vote of thanks of this association be extended Mr. Anderson and the members of the committee for the report on insurance.

The president then called for Mr. Ebert's paper.

Mr. Ebert: I notice that the program calls for "Mixers," while the subject of my paper is, "Proper Mixtures and Mixing."

PROPER MIXTURES AND MIXING.

BY C. B. EBERT.

In this paper I shall deal with the mixture of the materials rather than the mixing devices.

The mixing of the raw material for the manufacture of sand-lime brick, is a small matter in one sense, but a very large one in another. One of the first and most important things for consideration is, what have you to mix? Usually no other raw material than sand and lime enters into the combination of sand-lime brick, so it behooves the uninitiated to have his two materials examined and thoroughly tested before investing his good money in a sand-lime brick plant. It is said that any sand is suitable providing it consists principally of material containing silicic acid, which is the case almost everywhere, and more especially with bank or river sand and sandstone rock. A large portion of calcareous marl will make the sand useless, as the substance can not participate in the chemical transformation into silicates of lime. On the other hand, sand composed of small pieces of limestone has produced a very firm hard brick, when mixed with a small portion of finely ground clay in addition to the hydrated lime, but I do not recommend this sort of a mixture, because the brick of such a composition are not as refractory, in case of fire in a building in which they have been used. When the brick becomes hot enough to burn the small pieces of lime that are in them, and water is thrown on the walls of the building, the limestone particles will slake, burst the brick and cause the walls to crumble.

We are also told, that a small amount of fine loam will be of no disadvantage. Again I differ with that theory, because I have seen sands in which the individual grains were coated with a very fine loam or clay dust. This coating prevents the lime from coming in contact with the silica, consequently making an improper bond and a punky brick.

You can run this same sand through a washery to remove the loam, and you will have the silica in the proper shape, but that adds to the cost of production.

Again, some very good looking and hard brick have been produced from sand and loam mixed.

but I would not care to use such brick in a building, as they would disintegrate by frost or fire.

A high percentage of silica is very necessary, and without it you can not expect to get good results. Candidly speaking, it is a hard proposition to get a perfectly clean sand in the ordinary bank on account of the vegetable matter and soil on the surface, that caves down as the bank is worked. In such cases it is best to remove all of the top soil, prior to working the bank.

With river sand, you may get a good quality for a short time, and when the freshets come and deposit mud and slime on top of your sand, you are really up against a bad proposition. My advice in working river sand, is to get it out in large quantities and keep a supply ahead, so that it is unnecessary to go into the river immediately after a freshet, for your daily supply.

Sea sand is being used for brickmaking, but some have used it to their sorrow. Sea sand that comes in contact with the salt sea water will not make a good bond with the lime; again this class of sand is of the round grain variety. The only sea sand that is practical to work, is that which has been away from the sea water for years, and has been purified by the elements.

I was told by a man who has had charge of masonry work for one of the large railroads of the South, that in the whole State of Florida there was only one deposit of sand suitable for masonry work, and it was located about forty miles inland from the Gulf of Mexico, although there are a number of plants making sand-lime brick in that State.

Another matter of great moment in selecting sand is, to get it of varied sized grains. If it were possible to get it proportioned as follows, you need not worry about results: 20 per cent passing 20 mesh, 20 per cent passing 40 mesh, 20 per cent passing 60 mesh, 20 per cent passing 80 mesh, 20 per cent passing 100 mesh screens, providing it is a clean, sharp sand, and you are using a high calcium lime in your mixture, in proper proportions, you will get good results. Where you use a coarse sand of nearly one size grains, you will not be able to make a compact brick, impervious to water.

You must have a sand that has various sized, sharp grains, so that the smaller grains will fill the voids between the larger ones, also about 20 per cent of silica flour of 100 mesh and finer, if you intend making a high grade brick.

Lime—We are told that ordinary white lime, in a burnt condition, as used in making mortar for masonry work, is suitable. Also agricultural and shell lime can be used.

My advice to you is, go slow with the use of lime in this work unless it has been chemically analyzed, and practically tested with the sand you intend using. It is also necessary that your lime should be tested often, even if you are getting it from the same quarry and kilns. Limestone like all other mineral formations, runs in strata, and the various strata will vary in composition.

Without prejudice toward those using, or engaged in producing hydrated lime for sand-lime brick making, I must say that I personally prefer to use lump lime and hydrate it on the brick plant.

From what I can learn of some of the systems of hydrating as done at the lime company's plant, time governs the process. The lime is dumped into the hydrating machine or on the floor of the hydrating room moisture added and allowed to remain a certain length of time, or worked by conveyors, etc., according to the style of the machine used, until the allotted time is consumed, and called hydrated lime.

That system may answer providing the chemical composition of the limestone from which the lime is burned, is uniform. I know of one instance where a brick company decided to use lime, hydrated by a lime company. They ordered a carload, used the lime in one day's run and when they removed the cylinder head, they found about as many brick off the cars as on; the cause being, that the so-called hydrated lime was not thoroughly hydrated and had expanded in the brick when under steam pressure and water vapor.

That demonstrates the fact that if there are any particles of unsaturated lime in your brick when pressed, the steam or water vapor in the hardening cylinder will finish the slaking process and burst your brick.

As to the percentage of lime to be used, you must take into consideration that the composition of your lime and sand that enters into the mixture. You are told that 5 per cent of lime and 95 per cent of sand is the standard mixture, but is

this 5 per cent of calcium lime, or 5 per cent of lime containing 30 to 50 per cent magnesia? You must have the necessary percentage of calcium hydrate to bond with the silicic oxide to form hydro-calcium-silicate or sand-lime brick. We will find bricklayers who say they have to use 10 per cent lime. Are they really using 10 per cent calcium hydrate, or are they using 5 per cent of calcium hydrate in the 10 per cent bulk? Such things are often overlooked.

It has been thoroughly demonstrated that 5 per cent of calcium hydrate, with clean sharp silicic oxide, is a sufficient amount to make hydro-calcium-silicate or sand-lime brick. A proper mixture is governed by the quality of the sand and lime to be mixed, and when the mixture is made damp, a chemical combination takes place and forms silicate of lime.

If the moisture is introduced in the form of steam, the formation of the silicate of lime is more rapid. The silica sand is set free and coats the grains of sand which are brought into contact with each other, by the pressure exerted by the press in forming the brick, and a petrification ensues with a result that you have as near a natural sandstone formation as it is possible for man to make. To satisfy your optical sense, place a broken sand-lime brick and a piece of natural sandstone of similar texture under a glass, and note the similarity.

If you use a high calcium lime virtually free from magnesia and a clean sharp silica sand, you have an easier proposition than the fellow who has a magnesium lime and clean sharp sand, because he will get a chalky brick. Again if you have a high magnesium lime and round grain sand, you can not get a good bond, you have a chalky brick and you can rub the grains of sand from a hardened brick with your thumb or finger.

Should your lime contain a high percentage of calcium and be practically free of magnesia, your sand round grained, you will not get a good brick, while if you are using a high magnesium lime and a loamy sand, either sharp or round grain, your troubles will be too numerous to mention.

As to the methods of mixing the sand and lime by mechanical devices, I prefer to deal with that matter lightly as there are so many different opinions on the subject. Each system of hydrating, grinding and mixing of lime with sand, has its supporters, each having some strong points to present. The dry crushed lime, tube mill grinding of lime with a portion or all of the sand used, followed by dry and wet mixing with the 24 hour silo hydration before pressing; the vacuum hydration and mixing by batch; the hydration of lime in hardening cylinder, pulverizing, proportioning with sand direct from bank, mixing and pressing, are the leading systems, while others have invented methods of their own. By the tube mill system, the sand must be absolutely dry to prevent choking the tube mill. By the steam hydration and no tube mill, sand can be worked as moist as it comes from the bank.

While the dry process requires 24 hours to prepare the material for the press, the wet process requires less than thirty minutes for the sand to go from the bank to the hardening car. With the later, a dryer is only necessary when your sand necessitates screening.

Very good brick are being produced by the various methods of mixing, but it lies with the users of these various methods to say which one entails the least cost and produces the best results.

Quite a number of you gentlemen can speak for the various methods as you have tried most of them. None of us are too old to learn something new, and something to our advantage, if we can only convince ourselves that we don't know it all right now, and the other fellow knows nothing.

Many a brickmaker has made a success by accident, mixed with a little common sense (which is defined by a noted writer, as sense that is not common), while many a man with money, good habits, honest and industrious, has failed trying to study where he has made his mistakes, and by being satisfied with his own dear self, and the bounds of his own little realm.

Mr. Bovy: This works back into the subject discussed yesterday. We had up the matter of siloing only that portion of the sand which has been ground and considered the mixture of all the lime with such proportion of the sand. I would like a little more light on the subject.

Mr. Ebert: A sand when it is used wet from the bank is mixed with hydrated lime, no silo.

Mr. Duerr: Our silo material is only a portion of the sand and all of the lime, and the material is hydrated in going through the silo, so that it ages perfectly dry, comes in a dry state from the silo, and then is added to the sand just before it goes to the press; the sand being moist, (by moist I mean an average of 8 or 10 per cent water), because if the sand has more than 8 or 10 per cent moisture your mixture would be too wet, even for the press. I have not seen any sand that came from the bank or bar that had more than 10 per cent moisture. There seems to be no difficulty in getting a perfect mix. I have not seen any difficulty in mixing the two materials. I do believe, however, that if your material was moist, even 3 per cent of excess moisture in your silo material, you would have difficulty in mixing it.

Mr. Jackson: I agree with Mr. Duerr regarding some of his experience with mixing. I am an advocate of taking the sand, providing you can find it the right texture, direct from the bank, mixing it with the hydrated lime and pressing it into the brick with as short and simple a process as can be done. There are instances where the sand is too coarse or contains foreign matter that you have to dry your material or prepare it. That adds to the cost of brick, in order to dry your sand, screen it, or remove the vegetable matter. It costs fuel and additional power. That moisture has to be put back in the brick. At our plant in Saginaw we are making 120,000 brick every week. We take our sand right from the pit; and within fifteen minutes from the time the sand is taken from the pit, we have the brick on the car ready to harden.

Mr. Cleary: We take the sand right from the bank, hydrate our lime, mix it with the sand. We are now turning out 43,000 brick a day. We made 2,500,000 brick at the end of the first month, and we are away behind with our orders. As to tests our brick stood 6,000 to 7,000 pounds. Our brick right from the hardening cylinder stand a compression of about 67,000 pounds.

Mr. Bovy: What style of mixer do you use?

Mr. Cleary: Double shaft differential, running at two different speeds.

Mr. Bovy: If there is nothing further I would like to broach the subject of dryers.

Mr. Duerr: The dryer question was thoroughly gone into at last year's meeting, I think if you will take up last year's report you will find the subject pretty thoroughly discussed. I would like to know if anyone can give us figures as to the expense a ton of drying sand with a steam dryer. I believe our president is competent to give some information on the subject.

The President: Mr. Duerr knows very well that I can not give him what he has asked for. We can't tell the cost a ton of sand with a steam dryer. All the sand we can use from now till May 15 is stored under cover so that it will air dry to a great extent. Some of our Oswego river sand can not be dried in a steam dryer, and we are putting in a direct heat machine. At our Paragon plant the sand worked satisfactorily with a steam dryer. At our Buffalo plant our steam dryer is quite satisfactory. All that is wanted of the steam dryer is to get the sand dry enough to make it run freely.

Mr. Isenberg: I am sorry to have to say anything of our experience with steam dryers. We were unable to get a sufficient quantity of sand through the dryer to run half a day, but such as did come through was entirely satisfactory. We resorted to all kinds of innovations with the same result.

Mr. Van Glahn: The trouble with the dryer the gentleman has just mentioned is the lack of air. He had got heat, but you can not dry sand without air. His trouble is occasioned by the improper construction of the dryer.

Mr. Simpson: This gentleman has stolen my thunder. It is all in the construction of the dryer. There are lots of people who do not know how to construct a steam sand dryer. I am an advocate of the steam dryer. Mr. Bostwick here is the foreman of the United States Brick Corporation, of Michigan City, Ind., and they use a steam dryer. In summer time they use the exhaust steam which would otherwise be thrown away, because the exhaust steam goes through the heater first and heats the pipe before it goes to the dryer and they use no live steam. Now what does that dryer cost? No live steam is utilized in drying the sand, the only cost there is (because there is no manual labor) is the amount of power that the fan takes. They are making 16,000 or 17,000 brick a day, and they tell me this steam dryer will give

them as much sand as they need bone dry as is applicable to a tube mill. The mere fact of piling sand on the pipes is not going to dry it, you have got to get air through it.

Mr. Straight: I have had a great many years' experience in building dryers, and I will say that it is impossible to dry sand with steam heat, or any other, without having dry air in circulation. Take your dry air, pass it through the heated sand and out of the other end of the dryer, and you will have dry material. I agree with Mr. Van Glahn that not everybody knows how to build a steam dryer.

Mr. Van Glahn: We can regulate the moisture in our steam dryer in any way we choose. We put in a low pressure valve so that we can retain such percentage of moisture as we wish, and this can not be done with any rotary dryer.

Mr. Whetstone: We installed a dryer on the plans furnished by Mr. Simpson, and at the cost of one ton of coal for 10 hours we dry without any trouble 40 to 50 tons of sand. What the capacity of that dryer might have been I don't know; for we never had occasion to make any capacity test of our plant; but we do know that we tested up to the limit of capacity of our press every ten hours, with a consumption of about one ton of coal. Our sand shows moisture to about an average of $5\frac{1}{2}$ to 6 per cent.

Mr. Duerr: There is no economy shown in that statement. You have evaporated three tons of water with one ton of coal. Any direct heat dryer will guarantee an economy of one to eight.

Mr. King: We use a rotary dryer and dry from 55 to 60 tons of sand a day on one ton of coal costing \$1.85 a ton. We have never had any trouble at all.

Mr. Simpson: I don't advocate the steam dryer under all conditions. If there is any loam in the sand it is apt to stick to the pipes, and that is one limitation to the steam dryer. I have not been able to get the exact cost of running the steam dryer, but I think you will admit that 2,400 to 2,500 pounds of coal is a very small amount to use in a plant making 16,000 to 17,000 brick a day, drying all the sand and using a tube mill.

Mr. Berg: A rotary dryer about 25 feet long working with direct heat in conjunction with an exhaust fan can be built very cheaply to use the exhaust steam.

Mr. Duerr: I made some figures a couple of years ago on what the heat would do that we got from a cylinder, and I find that it will not pay for carrying the sand back and forth. I think there should not be any heat coming from the cylinder. If the cylinder was properly insulated that would give the greatest economy. It is surprising how much coal some of us are burning up because we are not covering our cylinders.

L. W. Penfield: I would like to ask if any of the sand-lime brick makers who are using two or more hardening cylinders ever followed the practice of steam connecting them so that they could take pressure from one cylinder to another.

Mr. Straight: We have two cylinders and empty from one into the other, but our experience has been that it is not practical to do that.

Mr. Duerr: We have three cylinders and have them connected so that we can discharge the steam from one cylinder into the others. I am inclined to agree with Mr. Straight, although when we are working two shifts night and day and the opportunity comes where we can help out one cylinder by taking the steam from the other, the economy is considerable.

Mr. Bovy: Has anybody ever made any experiment along the line of drying sand by mixing the sand with crushed lime and letting the lime take the moisture out of the sand for its own slacking?

The President: Mr. Tucker told us about that last year. He advanced the theory that it was useless to dry your sand, and hydrate your lime separately, when you could get nature to perform the act for you by simply combining the two and having the hydration take place in the silo.

Mr. Johnson: We take the sand from the hill in its natural state and mix it with the ground-up lime in the mixer, from there it goes into the silo where it becomes absolutely dry.

We find there is plenty of moisture in the sand before it goes into the silo. In the fall and winter time we use dry steam together with water.

The President: We still have half an hour and I would like to dispose of another number on the program, and I am going to ask Mr. Irvine to read the paper that was assigned to Mr. Defebaugh.

HOW TO GAIN GREATER PROSPERITY IN THE SAND-LIME BRICK INDUSTRY.

BY "ROCK PRODUCTS."

A long time ago, when this great city was a mere village, so the story goes, there was a negro boy, named Sambo, a fugitive slave. He had found his way here, and he readily found "he home," as a servant or house man. Very few people could afford to indulge in Southern fruits or field products of any kind, so Sambo had to accustom himself to his surroundings. Very often he was asked to serve dishes at table, such as sauer kraut or potato salad, delicacies of which he had no knowledge at all, and naturally he was guilty of a good many blunders such as putting a spoon in the kraut saucers or serving a fork with the ice cream.

A great occasion came when distinguished guests were being entertained, and Sambo's mistress had indulged in the extravagance of securing a water melon, which only the exclusive few could afford in these parts in those days. She was a little bit uncertain herself about the matter, and didn't venture to instruct her servant out right, so she proceeded in this way to ask:

"Now, Sambo, have you ever had any experience with water melons? Do you know the best way to carve and eat them?"

The Senegambian small eyes glittered, there was a flicker of the heavy eyelids, his big lips rolled outward until a half-moon of ivory showed horizontally across the lower segment of his countenance, and Sambo said: "Ah suttinly hab, and ah suttinly du du du."

Now I told the story to show you that I am in doubt, like Sambo's mistress, and will be perfectly willing to stand corrected in any of the views that I may express, by any of the practical gentlemen here who have been as close to the sand-lime brick industry as Sambo had been to the patch where the big green melons grow.

It strikes me, and my observation has not been limited by any means, that all the attention of the manufacturers has been concentrated at the manufacturing end of the business without taking any notice whatever of the important feature of marketing the product. That is, modern methods of salesmanship have not been resorted to for the purpose of producing such a return or revenue from the sales of the product of your plants as is commensurate with the amount of capital invested and effort and ingenuity required to manufacture sand-lime brick.

In the first place, the bricks, as they come out of hardening cylinder, should be carefully and rigidly graded into three distinct classifications, which I will call by their numbers for the present.

No. 1 Sand-lime brick should be perfect in every particular, square, clean corners and edges, all six surfaces perfectly plain without blemish, and uniform in color. Perhaps twenty to twenty-five per cent of the product would come up to the rigid requirements of this grade. The price for such No. 1 brick should be made to compare to, and to compete with, the highest grades of enameled and facing brick. They could be used for the interiors of such structures as railroad depots, store houses, vestibules, and all such specifications where marble is too expensive and plaster is not wanted or suitable. Then, in conjunction with other face brick, or by themselves alone, they could be used as a high type of face brick. They should never sell for less than \$18.00 a thousand, and could probably be sold at \$25.00 by a first class salesman. I believe that such figures would make a revenue upon one-fifth or one-fourth of the product, an amount equal to the total sales with the present methods of cutting prices to get down to the level of an inferior competitor, such as the common clay brick. Any body can purchase sales by cutting prices, but that is not good salesmanship, for there are buyers without number who will pay the kind of prices I have mentioned for the choice of the brick selected from the output of your cylinders.

A prominent architect, who is a close friend of mine, has expressed his views to me privately and it bears out this assertion. He has specified sand-lime brick in three fine residence jobs, and he says he means to use a whole lot more of them next year, but he only wants the top grade of brick for his outside walls and complains that he has to buy twice or three times as many sand-lime brick as he requires for facing purposes, and after they are delivered at the job, he has to grade them in

order to secure uniformity he wants in his wall surfaces, and then has to use up the rejects for walling up the laundry interior, or the furnace room, or some other portion of the work where they are not really needed. Thus the face brick which he is willing to pay for are made to carry the penalty of the lower grade which are forced upon the buyer in this way.

No. 2 Sand-lime brick should be good brick in every respect, with the four narrow surfaces, at least, perfect. Good corners and edges, and only a very slight variation of color should be permitted. Distinct lots of brick of like colors should be stacked together and marketed, or rather delivered, so as to make a complete job of one given tint or hue. It is absolutely necessary to keep an eye single to the matter of uniformity of color as well as to the other qualifications of this grade of work. Fully 50 per cent or 60 per cent of the product will be found to go into such a No. 2 grade, and if they are properly handled, separated, and compared nicely as to color, will readily bring a price equal to the top figures now paid for pressed brick in the markets of the country.

The No. 2 grade of sand-lime brick would go into the solid brick walls of moderate priced dwellings, warehouses, school houses, and this is, in fact, the grade to make popular for ordinary construction purposes.

The No. 3 grade would then consist of all the bricks that are left, including, of course, the small percentage of bats of good quality, and will compare very well with common clay brick. Provided the proper prices have already been secured for all the No. 1's and No. 2's as previously described it would be an easy matter to undersell all competition with these, and they are just as good as the best for the construction of inside walls that are to be covered with plaster anyhow.

This grading proposition can not be too carefully considered. It is one of the principal steps in the direction of greater success and larger profits. Another indispensable point in the successful marketing of any product, is to have the goods on hand when wanted. Few of the manufacturers carry a stock large enough to permit of anything like a careful separation of grades. Nothing is so disorganizing to any building operations, or so expensive, indeed, as the delay occasioned by the failure of prompt delivery of material at the job. If any manufacturer of building materials expects to hold up the contractor, while he makes the brick, he has no right to think that his material will be specified no matter how much it may be preferred. The man who can exhibit the goods he has for sale, or who can engage to begin delivery instantaneously, is sure to make sale to a large percentage of the builders of this country, who want prompt service, or, failing in this, they will fly to some other material that they can have delivered right off quick. If a customer selects his own samples from your stock, he will be better satisfied with your grade, and many a big job of brick can thus be sold with a guarantee of prompt delivery that could not be moved in any other way. I believe the experience of every manufacturer of sand-lime brick at this meeting will bear me out upon this point. There is not a more important factor in securing a larger and better market than that of having a big supply of properly graded stock on hand.

Having provided for quality in the goods, rigid grading into extra selects, selects and commons, if you please, the next thing is to force the consumer or buyer to know as much about your brick as you know yourself.

Ever since good Dr. Franklin, with his sound philosophy molded public sentiment by means of his printing press so as to make this great nation of a few scattered colonies publicity has been recognized as a powerful force which is at once an exact science and a liberal art. The one is bought and sold, measured out—weighed and delivered—the other is invisible, but still the greatest human power in existence, because it forms public sentiment, and that is the controller of all power, however expressed. Once public sentiment gives its favor to any industry, or rather to the product of any industry, then cost becomes a bagatelle, and price is the mere selection of comely figures.

The up-to-date intelligent salesman is alive to the value of publicity in any business undertaking, but from the very mysterious nature of the subject, there are few indeed who are able to understand it, or who know how to secure it. A life time study without attempting any other business would be insufficient to master a complete know-

ledge of even one branch of the great subject of publicity.

However, in these times of dry-plate photography and fine printing at low prices, it is easy to secure pictures of buildings and have such data attached as will be both interesting and convincing to everybody who sees it. The story should always be told so that it will interest and instruct the largest number of people who chance to see it, and in this way try to make millions, not hundreds or even thousands, of people, to know all about sand-lime brick. Make the knowledge of your excellent product reach even the school children, old and young so that every member of the community will learn that a new kind of brick which is finer than anything yet known, is now being made and marketed in this country. The sentiment of this wide-spread knowledge will rise and work like yeast in the bread till it fills the whole land, and then our machinery friends will have to work nights to supply your needs for additional equipment.

The trouble with such efforts at publicity as I have seen in connection with the sand-lime brick industry, is the palpable attempt to secure undivided attention for some special system or process as opposed to all other systems or processes designed to accomplish practically the same results, so that public sentiment (volatile as thin air until vitalized by concentration), refuses to get into the controversy. The sales department should take up the matter of publicity with due circumspection, that is, each plant, within its own shipping territory, with the aim and intention of reaching every man, woman, and child, with as full a knowledge as possible of sand-lime brick, its qualities, the materials it contains, the process of its manufacture, and the tests which it has attained, and when this has been accomplished, it will count in big numbers, for it works both day and night, when the plant is shut down and when it is running, when you are awake and when you are asleep.

A short time ago I was in Mr. Moroney's office, where I was shown the finest selection of pictures I have ever seen. All of them were houses built of sand-lime brick, and I will venture to say that any one of them would attract the attention and interest of every person who gets the opportunity to see them. Don't try so overlastingly hard to get at the intending builder and the specifying architect. The school boy of today will be an actual builder in a short time, and the architect does largely as he is told, and will specify what public sentiment tells him is the popular building material.

Now this is as far as I dare go. I am in real danger of mounting my hobby, for you all know that publicity is my own chosen profession, as familiar to me as Sambo with his water melon, where I began. Concluding my remarks, you all know the attitude of Rock Products in regard to the sand-lime brick industry. We know that you make the most perfect, the most beautiful, and for these reasons, the most desirable, and at the same time, the most really economical brick that has ever been offered on the American market. We feel that there are great possibilities and that all of them will be realized. As against all other building brick we are with you, doing our part every day with your assistance. We are for you, first, last, and in the middle, because you come with that matchless recommendation, "highest quality," which is sure to win.

L. W. Penfield: I think that paper is one of the best I ever heard, and I have in mind a case that is a perfect illustration of it, I think. A company was organized with six stockholders, all holding equal shares. Five of the six are attorneys of high standing. They had a plant built and equipped, started and operated with a superintendent in charge. They made brick of magnificent quality. They stopped there. Then it began to dawn upon them that there was a cog missing in the wheel, and that they had provided no means for selling their product. I will take pleasure in sending a copy of this paper when printed to that company.

Mr. Duerr: I wrote some two or three months ago to our foreign correspondents asking them to write us such things as would be of interest to the association, and I received one reply from Robert Brand & Son, Perth, Scotland. They have the only plant in Scotland. Unfortunately the letter has disappeared. The substance of the letter is that they are having practically the same experi-

ences in Scotland that we have had and are having, to some extent. Messrs. Brand & Son sent me a sample of their brick; and I am free to admit that I have never seen a better brick made in this country than the brick that they sent. With all that, they are having great difficulties in getting the brick on the market (the Scotch seem to be skeptical); but they are, like the rest of us, full of hope and have not as yet given up, and expect to do good work. They extend their best wishes to the association for its success, and the success of the individual members.

The President: Is there anything further we can take up this afternoon?

R. C. Penfield: Before passing entirely from the subject of the last paper I would like to hear from some members what they think about the suggestions therein. Can not something else be brought out to still further stimulate the sale of the product and the bettering of prices? It is the most vital subject that we can consider. If you can put one dollar a thousand onto your brick it is the biggest investment that you can possibly make; you can afford to lie awake at nights to figure out how to do that thing; and I much appreciate this paper; and in looking over here at some of the articles that I see before me I believe that if the members of this association would make a few brick, carry them in stock, build a little shed, put their brick under cover, put them up where they can be seen and give the architects and the builders and the people who are putting up buildings a chance to select their articles and get a few fancy shapes to go in with them, possibly make belting courses to imitate broken stone, something like the ones we have before you, and show designs of buildings so that a man can see what he is going to get instead of coming around and seeing a lot of brick standing on your hardening cars and not properly displayed for sale, it is possible to accomplish the results that are mentioned in that paper; and it is only possible to accomplish it in that way.

It is a hard thing to handle; because all the brick are of the same size and practically the same color. That is the greatest difficulty you will find in carrying out this plan of sorting your brick and making different priced brick; because in the clay brick, the finer grades of press brick are often colored; they are made of different mixtures of clay; there are different forms in the finer brick; and they can sort their brick and they can get \$40.00 to \$50.00 a thousand for brick no more beautiful than the highest class sand-lime brick.

The highest priced brick in the market in the East today are a light colored brick. A clay brick of that color is worth anywhere from \$30.00 to \$40.00 and sometimes \$50.00 a thousand; and it is too bad that the average price of sand-lime brick is as low as it is. If the manufacturers go at it right, I believe they can sell a large proportion of their product for practically front brick price.

Mr. Grath: I have had large experience in the manufacture of fine face brick, clay brick; I don't know of any manufacturer making fine face brick who is not equipped for making half dozen to a dozen different kinds of ornamental brick, round-cornered brick, and bead brick; and if the manufacturers of sand-lime brick are meaning to capture the architects they will have to make anywhere from half a dozen to a dozen different shapes or be prepared to make the different shapes of ornamental brick in order to get the architects to use their brick, because they will want to use different shapes; even in ordinary dwellings they will want octagonal brick or round-cornered brick.

In selling the sand-lime brick I think the salesmen dwell too much on the fact that they are sand-lime brick. If they would say "Here is a fine face brick"—don't say "It is a sand-lime brick," because in saying that too much you draw the people's attention to it and make them think that the brick is not as good as the clay brick.

The meeting then adjourned to 9 a. m.

The report of the meeting will be resumed giving the concluding session in Rock Products for March 22.

Charles D. Watson, well known to the cement users who attended the annual convention of the National Association as structural engineer with the Roman Stone Co., of Toronto, Can., has removed to Pittsburgh, Pa., with the Standard Building and Construction Co., at 10th and Duquesne Way.

Sand and Gravel.

An Epoch-Making Machine.

We have often taken occasion in these columns to make mention of the remarkable growth and present importance of the sand and gravel industry. In carrying out this idea we recently secured a statement from N. C. Fisher, President of the American Sand and Gravel Co., of Chicago, which records an epoch-making contract they have just placed. Montgomery Ward & Co. have just placed an order with this concern for all of the gravel which is to be used in the construction of their great re-inforced concrete warehouse which will be located at Chicago Avenue and the River in that city. The total floor space in this building will be 1,200,000 square feet and the concrete for the entire building consisting of walls, beams, floors and columns, will be constructed with the use of washed and crushed gravel, the fine crushed gravel acting as the sand in the concrete aggregate.

This material was selected after exhaustive tests made by the builders through their engineers. The total amount of aggregate material will approximate 125,000 cubic yards which will require a train of 25 cars daily, beginning April 1 and continuing to December 1 to complete delivery. This is the largest order for concrete gravel ever placed for one building, and shows the volume to which sand and gravel operations have already grown and indicates what may be expected.

Lignite in River Sand.

At the convention of the Illinois Masons' Supply Dealers' Association which is a branch of the Illinois Retail Lumber Dealers' Association an interesting discussion upon the subject of sand for plastering and for concrete work took place.

Most of the members of that association are either producers of sand themselves or are the principal handlers of sand at their respective markets. S. W. Curtis and C. M. Rose, of the Garden City Sand Co., of Chicago, were present and on account of their wide experience and personal knowledge of the sand proposition throughout Illinois, particularly, they were used by the convention acting as a committee of the whole as expert witnesses and were made to give up all the information that they could handily present in that much time. A member from down in East St. Louis complained of the sand which is pumped from the Mississippi river and said that it was unfit for side-walk purposes especially for putting on the top dressing. In every case where Mississippi river sand has been used to finish the sidewalks in his city in a short time pit holes appear, he said, which break up the surface completely with the great mass of little holes that look almost like worm holes in rotting wood. As Mississippi river sand is much the cheapest and practically the only available sand to be had in E. St. Louis the question was how could such difficulty be overcome.

H. H. Halliday of Cairo, one of the largest sand operators in the state, said that in the course of his operations he has taken sand from both the Mississippi river and the Ohio river because his market is located just at the point of confluence of the two streams and that no such difficulty has ever presented itself with sand that comes from the Ohio river, but all the sand that comes from the Mississippi soon develops this objectionable feature. Several years ago Mr. Halliday had the matter thoroughly investigated and it was demonstrated that the sand that comes from the Mississippi river contains a large percentage of particles of lignite which pops in the surface of the side-walk by expanding with the action of the atmosphere which causes a pop to occur which leaves a pit like a pock mark in the finished concrete surface. Mr. Halliday explained that the same trouble was had with Mississippi river sand at Memphis and other points further down the river.

Mr. Rose was of the opinion that the lignite feature in Mississippi river sand really originated in the Missouri river for no such complaint of the presence of lignite in the sand had ever come to his attention from sand operations in the Mississippi river above the mouth of the Missouri. A great deal of concrete work has been done with Mississippi river sand coming from the neighborhood of Keokuk and none of it contained this objectionable feature. Mr. Curtis explained that there would be no difficulty in working Mississippi river sand in the finest concrete surface provided the sand was put through an artificial dryer because the particles of lignite calcine and thereby lose their damaging characteristic at a low temperature. Mr. Curtis said that he had made careful examinations of these lignite particles and found that every one of them contains a black core indicating the presence of vegetable matter and the only way to overcome the difficulty is to employ only sand that has been artificially dried for the proper dressing or outside of concrete work where it is imperative to use Mississippi river sand. No such trouble would occur with the sand as it comes from the river inside the body of the concrete, because it naturally could not be exposed to the atmospheric changes of temperature and composition.

Mr. Rose talked at some length upon the subject of sand and plaster and as he has spent his life in this line in practical research it is readily recognized that he had the real goods. Mr. Rose stated that it was just about as hard to find uniformity in the plaster as it comes from the plaster mills as it is to find uniform sand; that in his experience it was easy enough to get the sand fairly uniform where the sand operator works conscientiously and intelligently, in fact some of the sand now marketed in Illinois is to his knowledge as uniform and reliable as any other building material, quite as much so as is Portland cement.

Some Changes That Must Come.

The outfit for the sand plant is the most interesting study that the machinery engineers have reported at the present time. The economy of securing a supply of sand at any given market determines the price to a great extent of all kinds of concrete construction and since the consumption of this product in this country is increasing in exactly the same ratio as that of Portland cement, only upon the basis of three times as much of sand as a cement, this acts as a slight gauge by which to measure the growth in the consumption of sand.

Advancing sand from the position of a distinct industry means much more than merely securing a supply. After it is secured, it must be washed, separated into a number of definite sizes and the gravel which is extracted from the sand must be handled in much the same intelligent manner.

Some concrete engineers at the present time insist that they are unable to secure any sand that is clean enough for the highest class of concrete construction, except by manufacturing sand, by sending clean, washed gravel through a crusher and in this way by direct mechanical pulverization secure the requisite portion of fine and coarse sharp particles, and on not a few of the most important concrete jobs that will be undertaken this coming season architects have specified that all of the sand that is to be used shall be manufactured in this way. This specification has become necessary for the reason that even in the largest market the sand operators have provided no equipment for washing, drying and separating their natural sand product in anything like an adequate way to meet the requirements already developed and now being developed by the first rank of concrete engineers.

It is almost impossible to pump sand from the bed of a stream without bringing up with the sand a considerable percentage of clay or loamy matter usually dubbed "mud" which is invariably carried by every stream in time of freshets owing to the inevitable erosion of the bank. The soil from the fields bordering every water course is naturally washed into the streams with every heavy rain to some extent and it is only by careful study and application of scientifically intelligent processes that sand can be secured that is suitable for the best concrete work. In bank or pit sand the condition is much the same. The sand almost invariably occurs in layers between beds of clay, shale or strata of limestone or sandstone and nat-

urally in the moving of the sand, the contiguous layers of other material become inter-mixed with it to a greater or less extent. In some sand pits the gravel is of much more value as a concrete aggregate than is the sand itself and a great many practical concrete men hold that a small percentage of clay in very fine particles distributed throughout the sand is an advantage rather than a drawback.

In all cases where sand is found in nature, or nearly all, the sand occurs in many sizes, from coarse to fine, and it is probable that an equipment could be devised that would do away entirely with the necessity for crushing clean washed gravel by securing the sand perfectly clean and in the sizes provided by nature. Even if it were found impracticable to retain the finest sizes of natural sand a proper percentage could be pulverized to make up the deficiency caused by discarding that which is found too fine and for that reason too illusive to be dealt with in any practical separating proposition. One thing is certain; few, if any, of the plants now engaged in producing sand, commercially, have given any consideration to their equipment looking in the direction of taking care of the requirements right ahead of us, nor are the engineers of the leading machinery concerns of the country prepared to definitely take up the equipment of such plant in its entirety.

In the last year or two several sand producing plants with excellent equipments have been erected for the purpose of manufacturing sand by the process of crushing, re-crushing and grading of sandstone, so as to produce an extremely high quality of commercial sand in all the useful sizes. And these remarks are not casting any reflections upon such plants or their equipments, we are dealing entirely with the reclaiming and handling of natural sands.

Locomotive cranes with clam shell grab buckets can be introduced with economy in every open sand and gravel pit. The speed with which such an enormous tonnage of loose material has to be handled makes this or some similar machines indispensable. We mention the locomotive crane for the reason that it is mounted upon a truck and not only moves itself by its own power but can even move loaded cars along the loading track so as to facilitate the operation of getting the material into direct connection with the plant. A series of screens to stop the various sizes of gravel and sand with plenty of water is necessary and a system of drying and resifting has yet to be considered.

All of these processes must be studied out and applied and still the price of the sand at the plant must be lower than it is now with nearly every establishment. This doesn't mean at all that the sand man must make less money, on the other hand it means that he must make more money, for after such intelligent equipment has been perfected his volume of business will easily be increased ten fold, or even more, within the brief space of a year or two. The problem of delivering sand at the job is one of first importance. A wagon containing a cubic yard requires a driver and two horses so that when it comes to the average haul in our larger cities every yard of sand worth not more than 50 cents at the plant costs \$1.50 for delivery. Perhaps this improvement will come in the shape of an automobile truck, but as it stands today, the delivery of sand at the job is away out of all proportions.

Of Interest to Sand Operators.

On another page of this issue under the head of "Convention Proceedings" in the Sand-lime Brick Department will be found a paper by E. W. Lazell, the official chemist of the National Association of Manufacturers of Sand-lime Products. This paper together with the discussion of the manufacturers assembled at Chicago in convention in December last should be read and digested by every sand operator in the country. Dr. Lazell and the men taking part in this discussion are undoubtedly the best posted and most studious aggregation of men who are interested in the sand industry. There is much need for thought and suggestion as to the present requirements for getting out commercial sand as well as that which will soon be developed.

Rock Island Sand and Gravel Co., Moline Ill., re-elected the full board of directors and the following are the officers for the ensuing year. C. J. Larkin, president; Henry Kinner, vice-president; Wm. McConnochie, treasurer, and F. D. Gall, secretary and manager.

Plaster.

Standardization is Necessary.

The manufacturers of Portland cement are easily in the lead of all other manufacturers of materials derived from the quarry, and undoubtedly set the best example which the lime and plaster manufacturers should take to heart and consider with a view to developing in connection with their own industries. We refer to the standard specifications which guarantee a practical uniformity of the product.

Just as soon as the Portland cement manufacturers secured a uniform product in this way the confidence of the building public was established to such an extent that the present universal adoption of the material was inaugurated, and no one can now tell what the limit of consumption is to be. The same principle can be applied to the lime and gypsum industries although not exactly in the same way. Such a standardization of lime and gypsum is demanded by the intelligent consumer already and it will have to come, sooner or later. It is time now for the American Society for Testing Materials to take the matter up in a preliminary way and while it is going to take time, labor and money to bring about satisfactory results, it will be found in the end that the game is well worth the candle, for by definite standardization alone can true public confidence in any building material be established.

The Production of Gypsum.

The production of gypsum in the United States in 1905, according to statistics compiled in the bulletin issued by the Department of the Interior, U. S. Geological Survey, under the direction of Edwin C. Eckel, amounted to 1,043,202 short tons, valued at \$821,967.00 as mined. This tonnage is largely in excess of the production of 1904, 940,917 tons, and slightly larger than the record production of 1903, 1,041,704 tons. In order of production for 1905 the states are ranged as follows: Michigan, Iowa, New York, Ohio, Texas, Oklahoma, Kansas, Wyoming, Virginia, Oregon, Utah, California, New Mexico, Nevada, South Dakota, Montana. The principal change in rank as compared with 1904 is that Iowa displaced New York for second position. The following table shows the production of gypsum in the United States from 1890 to 1905 inclusive:

	Short tons.
1890	182,995
1891	208,126
1892	256,259
1893	253,615
1894	239,312
1895	265,503
1896	224,254
1897	288,982
1898	291,638
1899	486,235
1900	594,462
1901	633,791
1902	816,478
1903	1,041,704
1904	940,917
1905	1,043,202

This bulleting of the Geological Survey classifies the disposition of gypsum under three heads, sold crude, sold crude and ground as land plaster, and sold as calcined plaster. In 1905 67,105 tons were sold crude at an average price of \$1.58 a ton; 40,196 tons were sold for land plaster at an average price of \$1.85 a ton and 736,708 tons were sold as calcined plaster at an average price of \$3.87 a ton. The range of price of gypsum sold as calcined plaster has not been very great in the five years from 1901 to 1905, the high water mark having been reached in 1903 when the average price a ton was \$4.77.

The gypsum which is imported into the United States comes chiefly from Nova Scotia and is nearly all calcined and converted into wall plaster.

A small quantity is used as land plaster and some is mixed in patent fertilizer. Nova Scotia and New Brunswick imported 349,378 short tons of gypsum into the United States during 1905 with a value of \$353,878.00. The imports from other countries were comparatively small and their cost was much greater a ton.

The following table indicates the relative rank of the various countries of the world in the production of gypsum, showing that the United States ranks second, figures for 1904 being given:

Country.	Tons.	Value.
France	1,794,875	\$2,916,483.00
United States	940,917	2,784,325.00
Canada	298,211	316,436.00
Great Britain	262,086	354,138.00
German Empire	25,095	17,307.00

The Art of Plastering.

In the January 22 issue of Rock Products the development of the art of plastering during the Renaissance in Italy was discussed and a picture was shown illustrating the wonderful work done by the school founded by Giovanni da Udine. Raphael's assistant, in Florence. But just as Italy was not the only nation affected by this rebirth of art and learning so Italy was not the only nation in which the art of plastering was developed. Two great monarchs were living in those days, Francis I, of France, and Henry VIII, of England, men who were vying with each other in all branches of human endeavor and striving to outdo the rest of the world, and they did their part to introduce stucco decoration to their respective countries.

In France a considerable attempt to model in the ordinary plaster had been made before the time of Francis I, and many of the fine Gothic-hooded chimney-pieces in the chateaux were modeled in plaster on wood cradling. But as far as pure white stucco in ornamental work goes Francis I deserves the credit for its first introduction to France. Giulio Romano, who had been commissioned by Raphael to complete the latter's work, was busy in Florence along about the first quarter of the sixteenth century, when Francis resigned, and there he did works in stucco that were renowned throughout Europe. His school of stucco workers achieved such a reputation that Francis I wrote to Duke Frederick Gonzaga praying him to send him some young man able both as a painter and a stucco worker to assist him in decorating his new palace at Fontainebleau. Of course Giulio Romano being the head of the school and the dean of stucco workers, was called into conference by Duke Frederick and the result was that Francesco Primaticcio, the son of a wealthy Bolognese merchant, whom a love of art had seduced from the ways of commerce, was sent to Francis. Primaticcio gathered around him a large staff of modelers, of which he became superintendent, and together did the first stucco work ever executed in France. At Fontainebleau he did noble figure work and his long graceful figures formed the basis for the work of the French school of sculptors in which Gouger, Pilon and others were prominent. An illustration of Primaticcio's excellent work is shown in the illustration. Of course Francis I could not emulate the arts of Italy without Henry VIII hearing about it and becoming interested on his own account, and this latter monarch decided to have some of this excellent work done in his palaces. But that concerns the introduction of stucco modeling in England and is another story. Next month we shall learn something about this and about Henry's famous Nonsuch palace.

Plaster Interior Decoration.

Some readers may have wondered what purpose we have in mind in publishing from month to month articles on the "Art of Plastering," giving a brief history of the development of this ancient and honorable art and illustrating this history with examples of the wonderful work of the different periods. Some with minds trained to love historic lore may have found them interesting only from the historic point of view. Others with minds running headlong in a commercial groove may have considered them so much dry rot. But there may be one or two, who have divined the

purpose of these articles without knowing that they have done so; the articles may have suggested to them some modern use of the art of those master stucco workers of the Renaissance.

This was the main purpose of this series of articles, the suggestion that modern methods might be adapted to the art of those old masters. With such a product to work with it seems entirely possible that some genius will develop means by which the ancient art of plastering as practiced during the Renaissance period can be adapted to modern uses, and that artistic interior decoration in stucco work can be placed within the reach, commercially, of the great part of the population of the United States. Of course we have already seen this idea worked out in the buildings of our great World's Fairs and have noted the splendid effect, artistically and architecturally, gained by the use of staff. We have heard of "plaster enrichment" which has been used in the Hall of Records in New York and which is nothing more than plaster painted to represent marble. But we have yet to see stucco interior decoration developed to anything like the height it reached during the Renaissance.

Objection may be raised by some that such interior decoration is the work of the sculptor and that in our present strenuous existence we have neither the money nor the time to give for the work that made the famous examples of interior decorations reproduced in this paper. It is undoubtedly true that if this interior work were to be done as it was done in the fifteenth and sixteenth centuries the cost would be prohibitive even for some of our money kings. In those days the members of the royalty had but to command and their command was executed and a year, as far as construction went, was not as great a length of time as a month at the present swift pace. Therefore we can not afford to employ sculptors to decorate our buildings in the manner in which the wonderful palaces of old were decorated.

But this brings us to the point of the article. Gypsum, itself, is not at a prohibitive price; it is durable and capable of being molded into almost any form. Will not some genius develop a method whereby friezes, brackets and other ornamental pieces may be molded by machinery and kept in stock by material dealers for future use? We have plaster board. It yet remains for this genius to design the molds whereby limitless quan-

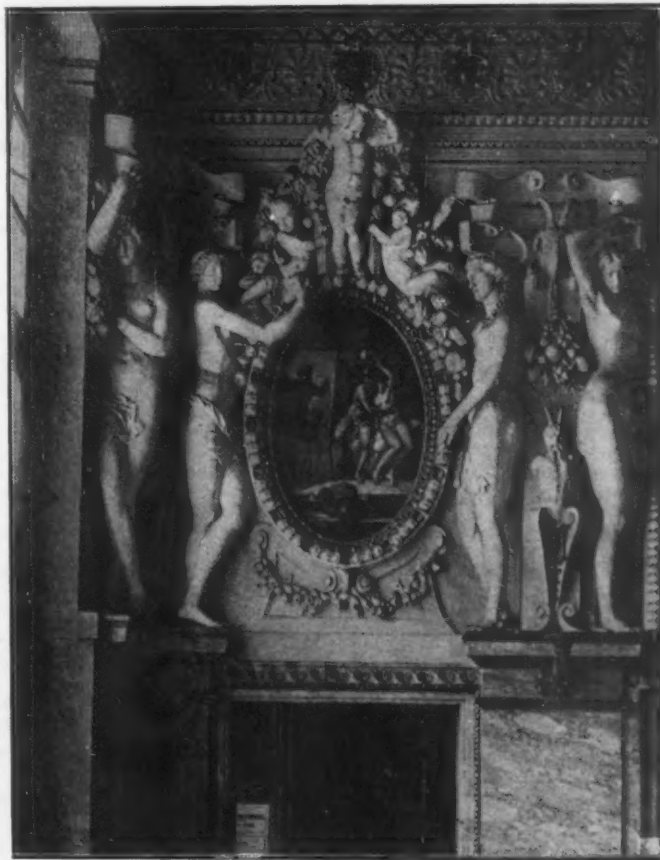
titles of these ornamental pieces may be molded and kept ready for use.

By some such means it is entirely possible that the art of interior decoration with stucco or plaster may be placed on a commercial basis and the genius who develops this plan will get the fortune. There is neither time nor space at our command at present to develop this thought to the extent that we believe it deserves but we drop this suggestion hoping that the seed may fall on fruitful soil and place the plaster industry where it belongs.

Trade School for Plasterers.

CLEVELAND, O., February 15.—This city has probably the only trade school for the teaching of plastering in America. The school was opened a few weeks ago at 532 Champlain Avenue under the direction of George Ehrbar, who is a practical plasterer and bricklayer. Students are taught the art of mixing and making plaster and are then given lessons on the spreading of the material, the covering of difficult spots and the doing of the more ornamental work. A course of five months is given and at its completion students are presumably qualified to go on ordinary jobs. Quite a number of students have enrolled for the course.

Last year a school of bricklayers was opened in Cleveland under the direction of the Mason Contractors' Association. Fifty students graduated and at once secured work most of them at union wages. The school this year was reopened under the direction of the same superintendent, Mr. Ehrbar, who also decided at the same time to open a school for plastering in conjunction with bricklaying. It is claimed that the various plasterers' unions as well as those formed by bricklayers, are restricting the number of apprentices to such a point that not enough men are being trained to take care of the increasing demand. The trade school is said to fill this want for men are given as thorough a training in five or six months as they often secure in an apprenticeship of three years in the old way. It is aimed to make the course practical as well as theoretical, and to this end the students are given individual instruction with the trowel and board and taught the art step by step.



STUCCO DECORATION PALACE OF FONTAINEBLEAU, BY PRIMATICCIO, 1536.

In the Gypsum Belt.

FORT DODGE, IA., February 19.—The United States Gypsum Co. has announced the removal of its western sales offices from this city to quarters in the Lumber Exchange in Minneapolis. The operating department will be maintained in this city as it always has, but the removal of the sales department is with a view of getting in closer touch with the larger business interests and trade of the company in the northwest. Manager F. W. Farrington announces that the prospects for business this year are unusually bright but the one thing which gives him concern is the shortage of cars which he fears will prove a serious matter in the spring when trade opens up.

The foundation for the new factory of the Sackett Plaster Board Co. is now completed and work on the structural portion of the plant has been postponed until weather conditions will permit. The plant is being constructed adjacent to one of the stucco mills of the United States Gypsum Co. The main building will be 48 by 300 feet. The company has contracted for 60 tons of stucco a day which will produce in the neighborhood of six cars of finished product.

The new plants of the American Independent Gypsum Co. and the Iowa Hard Plaster Co. are both enclosed and work is being pushed so that the plants will be ready for operation by spring. Miners are now at work in the mines getting out rock for spring business.

A Modern Retarder Mill.

WEBSTER CITY, IA., February 16.—The Chemical Stucco Retarder Co., of this city, have a modern and well equipped mill now in operation. The mill, which is 36 by 140 feet and two stories high, is located on the Illinois Central and the Chicago & Northwestern railroads. It has a capacity of eight tons a day. Raymond pulverizers and air separators are used, insuring a fine and uniform product. Their territory is from the Mississippi to the Pacific ocean. The company has many customers on the Pacific coast. S. S. Parkhurst, secretary and general manager, says that prospects are bright for the season of 1907.

Operating Many Mills.

LAWRENCE, KAN., February 15.—The American Cement Plaster Co., with headquarters in this city, is expanding and forging to the front with rapid strides. This company has mills at Acme, Tex.; Watonga, Okla.; Langford, Kan., and two at Blue Rapids, Kan., and are just completing one at Grand Rapids, Mich. This will be one of the largest and most modern mills in the country. It will be of fire-proof construction throughout and will have a capacity of 400 tons daily. The American Cement Plaster Co. makes the following well known brands: Aglite and Eagle dark plasters, Crystal Rock and Krisolite white plasters and Satin Spar and Eagle finishing plasters.

Notes of the Trade.

The American Land Plaster Co., of Grand Rapids, Mich., has let the contract for the erection of a new mill that will cost \$100,000.00.

The Sleep, Elliott & King Co., Great River, Suffolk County, N. Y., has been incorporated with a capital of \$35,000.00 to do plastering and ornamental work. G. F. Sleep, A. B. Slade and C. A. Goodspeed are the directors.

The Arden Plaster Co., of Los Angeles, Cal., has been incorporated with a capital stock of \$100,000.00, of which \$31,000.00 has been subscribed, by W. J. Pierce, Henry Newby, Edward J. Pyle, B. M. Patterson and Henry H. Klamroth.

It is said that another gypsum plant is to be built in Marshall County, Kan. Matt Wacek, of Irving, Kan., and Iowa capitalists are said to be interested in the project. An eight and a half vein of gypsum is said to have been located here eighty feet below the surface.

At the annual meeting of the National Wall Plaster Co., Syracuse, N. Y., the following officers were elected: Charles S. Averill, Daniel O'Brien, Russell R. Stuart, Howard H. Lincoln, Gilman E. Baldwin, Charles R. Walker and Harvey E. Dingley. Mr. Averill was elected president, Mr. O'Brien vice president, and Mr. Dingley, secretary and treasurer.

Clay.

The Street Paving System.

The season of the year will soon be at hand when the paving brick manufacturer will be "getting his'n," to use a slang expression, and indications are that his opportunities will be greater than ever before to secure a share of the great prosperity of the country. It is certainly to be expected that with the enormous prosperity of the country in all lines of trade the municipalities will be looking towards the improvement of their streets. A progressive city must have good streets and nowhere can they find better and cheaper streets than those built of vitrified paving brick. Good streets are not only necessary to the attractiveness of a city but also to its commercial progress. It is up to paving brick manufacturers to see to it that they are not overlooked when specifications for paving streets are made in their own and other cities.

An Attractive Souvenir.

Chas. H. Claiborne, representative of the Union Mining Co., of Mount Savage, Md., was a busy man of the conventions of the National Lime Manufacturers' Association and the National Builders' Supply Association in Columbus, O. Mr. Claiborne gave the delegates neat souvenirs which served to advertise the well known Mount Savage fire brick. These were miniature bricks, bearing on one side the name "Mount Savage," and on the other side the dates, 1841-1907, for this well known concern has carried on a successful business since the former date. Mr. Claiborne used these bricks in place of cards and they were readily recognized by the delegates.

Clay Workers at St. Louis.

Four conventions in sessions at one time brought the largest crowd of clay workers ever together at one time to St. Louis, the week of February 4. The four associations which met in convention were the American Ceramic Society, the National Brick Manufacturers Association, the National Paving Brick Manufacturers' Association and the National Association Manufacturers Clayworking Appliances. The sessions of all the societies were most profitable and much good to the industry as a whole will no doubt result. Interesting papers were read at the sessions of all the conventions and much time was spent in visits to the various clay-working plants around St. Louis, where the visitors learned of interest and value.

Notes of the Trade.

Borough President Coler has asked \$2,500,000.00 for repaving and repairing the streets of Brooklyn. Whether he gets this large amount or not it is safe to say that there will be much paving work done in Greater New York during the coming season and the vitrified brick men will get their share if they are wide awake and "doing about."

Michigan brick yards turned out 292,690,000 bricks during 1906.

The National Clay Products Co., Jersey City, N. J., has been incorporated with a capital stock of \$50,000.00 by James J. Murphy, Elmer H. Geran and John I. Mara.

The Adams Brick Co., of Indianapolis, Ind., has purchased the Veedersburg, Ill., clay plant for \$18,500.00.

The Maine Clay Products Co., of Thomaston, Me., has been incorporated and preparations made to start a plant. It is estimated that the output of the plant will be between 50,000 and 75,000 brick a day.

The paving brick plant of the Banner Clay Works, at Edwardsville, Mo., was damaged by fire to the extent of \$20,000.00 January 30.

Burnt Clay for Road-Building.

A short article which recently appeared in *Farm Progress*, published in St. Louis, Mo., contains information which may be of interest to those who have not been able to make good permanent roads on account of lack of gravel and stone, and shows how burnt clay has been successfully utilized in this connection.

The Public Roads Office of the United States Department of Agriculture, so *Farm Progress* states, is experimenting with novel methods of making roads. The experiments have so far been confined to the clay or "gumbo" roads in Mississippi, and are entirely new. The roadbed selected for treatment is graded to an even width between ditches and then plowed as deeply as possible. Furrows are then dug across the road from ditch to ditch, 4 ft. apart.

Cordwood is placed in the ridges thus formed, and the plow clay is laid thereon in layers, care being taken to provide flues in order that the wood will readily burn and bake the clay. When the firing is completed, the treated clay is rolled and compacted to 8 in. in thickness. The clay has been changed by the burning into clinkers, which compact into a solid roadbed, and which will not form mud.

The cost of such road in a country where wood sells at \$1.30 a cord was \$1.478 per mile, and while the wearing qualities of the road have not been ascertained, it is believed that it will wear as well as any other made roads. In many sections the drawback would doubtless be in the difficulty in obtaining wood. Perhaps petroleum might be introduced as a substitute.—*Brick*.

All Kansas clay products plants are said to be months behind in getting out their orders and the demand is increasing.

The Chanute Tile and Brick Co., of Chanute, Kan., has been incorporated with a capital stock of \$125,000.00 and will erect a brick plant three miles west of that city.

A bill has been introduced in the Iowa legislature for the establishment of a department of ceramics at the state school of agriculture at Ames. The bill carries an appropriation of \$9,000.00 for this purpose.

The price of common brick in Spokane, Wash., has advanced to point higher than has ever before been known in that city.

The Dow Brick Co., of Columbus, O., has been incorporated with a capital stock of \$40,000.00 by E. W. Dow, D. W. McGrath and J. A. McDonald.

The Ellis Brick Co., has been incorporated at Toledo, O., with a capital stock of \$15,000.00 by H. J., E. H. and R. F. Ellis, and Clayton W. Everett.

The Dover Brick Co., Dover Plains, N. Y., has been incorporated with a capital stock of \$200,000.00 by Carl Wisner and Henry B. King, Chicago, Ill.; W. S. Ketcham, Dover Plains, N. Y.

The Arvada Brick Co. has been incorporated at Denver, Col., with a capital stock of \$80,000.00 by O. D. Cass, J. D. and W. G. Maitland.

Elmer L. Goehannour, Streator, Ill., is interested in a project to establish a vitrified brick and sewer tile plant at Austin, Texas.

The Keystone Mining and Manufacturing Co., Henderson, Ky., is said to have found a valuable deposit of clay 400 feet below the surface in its mines. Tests have been made by brick experts and the clay is said to be of excellent quality for fire brick and other clay products. A company will probably be formed for operating this find.

Now that the annual convention season is about over, let's all get down to work with a hearty good will. We have all enjoyed the conventions and profited by them, now let us turn what we acquired into money.

THE crop of motorists is ever on the increase and their clamor for better roads is already being felt by the macadam producer in certain sections. This is a disease that is certain to spread and call for more crusher product to make better roads all over the country, thus the invention of the automobile contributes to the profits of the stone crusher.

A Fire Block for Cement Kilns.

The Laclede Fire Brick Manufacturing Co., of St. Louis, Mo., is making a specialty of fire blocks to be used in cement kilns, which are known as Bauxite blocks, and have given satisfactory results under severe tests. This company has issued a pamphlet, which is complete, and reports tests of their fire block which show them to be a success. Its description of a recent test is as follows:

"On March 17, 1905, the hot zone of a six foot rotary, sixty feet long, burning pulverized coal was covered with a six inch lining of bauxite. On February 22, 1906, this lining was removed after a continuous run of eleven months and five days, or 8,208 hours, during which time at least 75,000 barrels of cement passed over this lining.

"On examination the blocks showed an average loss of about two and one-half inches, while a number of them had not worn much over an inch. Fig. 1 represents the original block, on top of which is placed one of the blocks taken from the hot zone after a run of eleven months and five days. There is no exaggeration of the facts when it is assumed that the blocks would easily have lasted over the year if they had not been taken out.

"A suitable block for lining rotary Portland cement kilns must have a chemical composition similar in nature to the cement mixture, that is basic, so that it is not attacked by the cement coating. Bauxite blocks are basic, having an especially high content of alumina, and the affinity for the cement mixture and the lining is therefore not strong.

"On the other hand, its physical characteristics render it suitable for rotary kilns, as it is made to a certain degree of hardness and porosity con-

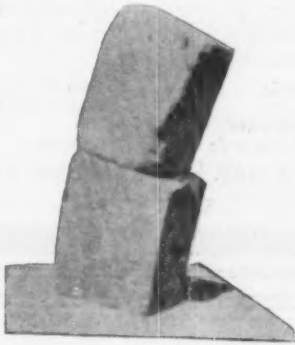


FIGURE 1.

ductive to the adhesion of the cement coating which affords it protection from the direct flash of the flames and greatly insures its length of life. The degree of hardness is important for the reason that the coating often sticks to a soft brick at first and then portions remaining with the coating break off from the brick. In other words, the adhesion of the coating to the brick is stronger than the bond of the brick itself. The extreme of great hardness on the contrary seems to prevent in certain cases the proper coating of the blocks with the cement mixture, thus exposing the lining to direct contact with the highest heat of the kiln.

"Furthermore bauxite has a very low heat conductivity and accordingly the losses by radiation are cut down somewhat, and a six-inch lining can be used in place of a nine-inch fire brick lining which increases the capacity of the kiln to a considerable extent."

Some of the plants that have installed this system and found it satisfactory are Speed & Co., Louisville, Ky.; Northwestern Portland Cement Co., Mason City, Ia.; Whitehall Portland Cement Co., Philadelphia, Pa.; Elk Cement and Lime Co., Elk Rapids, Mich.; Vancouver Portland Cement Co., Victoria, B. C.; Lehigh Portland Cement Co., Allentown, Pa.; The Portland Cement Co., Portland, Col.; Omega Portland Cement Co., Jonesville, Mich.; and Edison Portland Cement Co., New Village, N. J.

Side Talk.

The Century Cement Machine Co., of Rochester, N. Y., reports a strong demand for the 1907 Hercules, and has prepared for an unprecedented business. Progress is the keynote throughout the factory, and the 1907 model shows that improvements have been made wherever possible. The machine as it stands today is a giant in strength and there is no denying the fact that its strength lies in the wonderful simplicity of mechanism. Indeed it is really marvelous how such a simply constructed machine can turn out such a variety of designs and sizes of blocks, sills, lintels and ornaments. In many of the large contracts for concrete construction which were completed last year, all blocks were made on the Hercules. The immense power house of the New York, New Haven and Hartford railroad, at Cos Cob, Conn., and a large building for the General Electric Co., at Schenectady, are two instances.

Herbert L. Sherman and Robert S. Edwards announce that February 15 they consolidated their interests under the firm name of Sherman & Edwards, and will occupy new offices and laboratories for general consulting and analytical chemical work, chemical engineering and physical testing at No. 12 Pearl Street, Boston, Mass.

When the Anchor Concrete Stone Co., of Rock Rapids, Ia., incorporated two years ago, they little thought that within such a short time their business of manufacturing machines would grow to such vast proportions. However, the principle embodied in the construction of the Anchor block impresses the public at once as being absolutely essential to the construction of dry and frost proof walls.

At the various conventions where the Anchor block and machine were on exhibition many visiting the Anchor booth invariably exclaimed that the Anchor was the only proper building block manufactured. The Anchor is the most simple, durable and clever machine now on the market, although the patents covering the Anchor machine are basic and contain much broader claims than the patents on any other machine.

The Anchor block is universally recommended by architects as the kind of block that will make a permanent wall, by reason of the fact that all the material in the Anchor block is immediately over material when laid in the wall and the wall must possess the full strength of the concrete from which the block is made. A building erected from the Anchor block will have an air space running around the entire building and from the basement to the eaves, which will result in a house being dry and free from frost in the winter and cool in the summer. It is no longer a question whether or not frost or moisture will penetrate the Anchor wall in so far as there are over four hundred buildings now built from this block and each and every one is plastered immediately on the block. A great many of these buildings have gone through two winters and others through one winter, and are located from Canada to Florida. They have been thoroughly and fully tested in all climates and under all conditions and in each instance have proven more than satisfactory to the owner.

The Anchor shops are now busy completing machines for the spring trade and expect to set up and dispose of two thousand machines the coming season. The line of machines carried by the Anchor people cover everything in the line of beautiful molds for building blocks.

This company puts out some of the most instructive and suggestive literature of any block machine factory. It supplies prospective purchasers with cuts of a great many buildings built from the block, giving the names and address of the owner and urgent invitation to write the owner and verify all the claims made by the company. The Anchor company is one of the largest, most prosperous and progressive of any new manufacturers of cement machinery in the West. Their advertisement appears on page 96 of this issue. The company will be more than pleased to furnish free

of cost their catalogue and literature giving full description of the Anchor continuous and air space block and machine.

The Charles Warner Co., Wilmington, Del., has a number of copies of a booklet entitled, "Treatise on Water Proof Concrete and Portland Cement Lime Mortars." They are for free distribution to parties interested who apply for them. It is well worth reading for it contains much original matter developed by original research for the benefit of the practical users of mortars of every description.

The United Cement Manufacturing Co., of Columbus, O., which represents the consolidation of the Harmon S. Palmer Co., The Winget Concrete Machine Co., the Cement Manufacturing Co., the Iver Block Machine Co., and some thirty other small concerns controlling patents and improvements on block machinery, mixers, molds and tools, announce that they have established demonstrating plants that are running every day in the year at the following locations, and every interested party is cordially invited to call at the nearest demonstrating plant to his home location and see by personal investigation all there is to be shown about concrete machinery, as each of these plants is in charge of a courteous attendant who will be pleased to furnish whatever information may be required:

No. 54 West Maple Street, Columbus, O.
Fourth and Washington Streets, Burlington, Ia.
No. 1450 Girard Street, Washington, D. C.
No. 420-422 West 23d Street, New York City.
No. 100 First National Bank Building, Waterloo, Iowa.
No. 1201 West 7th Street, Los Angeles, Cal., and Pasadena, Cal.

The Fisher Hydraulic Stone and Machinery Co., in the Builders' Exchange, Baltimore, Md., has issued a brochure which sets forth in complete detail and by copious illustrations the process which they have developed for the manufacture of concrete building stone. They are early in the field and were the first to recognize the importance of ramming the concrete mass under tremendous pressure. The machine which they now build is really the product of careful study and research as well as practical experimentation, directed toward securing the best possible results without regard to cost. They use the hydraulic ram capable of applying a maximum pressure of 200 tons and maintaining such pressure for any period of time within the judgment or disposition of the operator. W. H. Fisher, the inventor, comes originally from Memphis, Tenn., and in that city he first began the development of his system for the manufacture of concrete stone. The greatest claims that he makes for his equipment are the quality of the stone, the range of the machine, which is designed to take care of every structural requirement, as well as the regularity and volume of output where the machines are properly placed and operated upon a factory basis. This concern has never catered to the little hand shop idea but has confined all of its attention to well organized and adequately capitalized concerns who are directing their efforts toward the manufacture of only the best concrete building material and who are looking for the real economies of a large daily output based upon a demand won upon the quality of the product, itself. They state that they will be glad to furnish a catalogue and full information to interested parties who may inquire for such information at the above address.

The Power and Mining Machinery Co., Cudahy, Wis., has just issued Catalogue No. 7 which describes in detail their complete line of cement-making machinery. The catalogue picks up every process in the manufacture of cement, starting with the quarry where the rock is obtained and conducting the raw material to the crushers; from there the preliminary grinding and mixing of material introduces the composition into kilns of their own construction and delivers the clinkers into storage receptacles. Then there is the tube mill where the finish grinding process for the completion of the cement takes place. They say that they mean to have this catalogue reach every person who is interested in cement making machinery and they will be pleased to forward a copy free of charge to those who are sufficiently interested to make application.

Wanted and For Sale

One insertion, 25c a line; Two insertions, 50c a line; Three consecutive insertions with no change in the composition, 50c a line. Count eight words to a line; add two lines for a head.

WANTED—HELP.

COMPETENT FOREMAN with temperate habits for modern cut stone plant. One with some architectural and technical training preferred. State age, experience and wages expected. Address C 4, care Rock Products.

EXPERIENCED and capable man to take the management of a stone quarrying sawing and crushing plant. An exceptionally fine grade of white limestone for building purposes. Straight salary or salary and percentage of profits to right man. Address C 5, care Rock Products.

FIFTY QUARRYMEN—Wages \$1.54 per day with board and lodging. Excellent locality. **JAMESON LIME CO.**, Tehachapi, Cal

SALES MANAGER for plant, fifteen hundred barrels capacity; one familiar and acquainted with Middle West Territory. State experience and salary expected. Address **KANSAS CITY PORTLAND CEMENT CO.**, Kansas City, Mo.

WANTED—POSITION.

AS FOREMAN or Superintendent of ballast quarry; have had twenty years' experience. Am perfectly familiar with gyratory crushers and all machinery necessary for operating ballast plants. Best of references. Address Y 16, care of Rock Products.

AS SUPERINTENDENT or Foreman of crushed stone quarry versed in drilling, blasting, etc. Prefer the East. State capacity and salary. **HENRY GASTEN**, Franklinville, N. J.

EXPERIENCED MAN capable of designing, erecting and operating stone crushing plant, thoroughly familiar with quarrying, blasting and handling high explosives is open for a position March 1; married, strictly temperate, gilt edged reference. Have extensive acquaintance with contracting consumers in West and Southwest. Address **HOO HOO**, Lock Box 304, Chicago, Ill.

WANTED—MACHINERY.

DAY OR BROUGHTON plaster mixer, in good condition. Address **FRED GOEPFER**, Indianapolis, Ind.

WANTED—MISCELLANEOUS.

CEMENT MEN to write for our well, curb and block molds; also hand power mixer. Address **REHFUSS MFG. CO.**, Lacrosse, Wis.

FOR SALE—MACHINERY.

AT A BARGAIN—Three simplicity concrete block machines, one standard Sand and Machinery Co. mixer; one dry mixer with elevator, block tongs, fixtures, etc. Will sell as a whole or part. A good chance for any one desiring to enter the concrete block business. Good reasons for selling. **CHAS. L. McNUTT**, Manager, 114 Poplar Street, Jackson, Tenn.

CHAMPION No. 5 rock crusher, used five months, good as new, too small for our use. Can make immediate shipment. **POTOMAC LIME AND STONE CO.**, Frederick, Md.

GATES No. 4 Gyratory Rock Crusher in good order; also engines and boilers. Address R. P., Box 2, Station A, Cincinnati, Ohio.

SEVEN SECOND-HANDED Horizontal Sturtevant Mills 42 in. in diameter. Address **NEWAYGO PORTLAND CEMENT CO.**, Michigan Trust Building, Grand Rapids, Mich.

SMITH TUBE MILL SHELLS, three with silx lining, 4x16 feet. All in A-1 condition. We offer the above for sale on account of rearrangement of our grinding department. **ALMA CEMENT CO.**, Wellston, O.

ONE ALBERT RAYMOND three roller inverted mill with vacuum separator attached, including blower complete. Never been used except to test the pulverizer. **ST. LAWRENCE FILLER CO.**, Massena, N. Y.

FOR SALE—PLANTS.

FLINT CRUSHING PLANT near LaFayette, Ind. Nothing like it in the country. Other business takes my time. **EDWARD HELY**, Cape Girardeau, Mo.

ONE LIME KILN 40 ft. high; 30 feet encased in sheet steel, bolted together with patented funnel shaped bosh, discharging from center of kiln.

1 Jeffrey crusher; 1 Jeffrey stone elevator, used for conveying shells to top of kiln about 75 feet long.

1 swinging derrick with 30 ft. boom and 8 h. p. hoisting engine and two revolving discharge buckets.

1 belt conveyor 6 in. cups; 1 belt conveyor 8 in. cups; 1 75 h. p. engine; 1 75 h. p. boiler; 1 revolving screen; 8 sheet iron cars on wheels for hydrating lime. Two O'Connell patented boilers for lime kiln used in furnace to generate steam for artificial draft and 4 blowers with same. All the above is in good condition. **LOUISIANA LIME CO.**, Hennen Bldg., New Orleans, La.

MONEY MAKING Soft Mud Brick Yard. Great opportunity for a practical man. Good profit and can not supply demand; 30 thousand capacity. Will sell at a bargain on easy terms as owner has large interests. Write at once. **TEK-RE HAUTE P. BRICK CO.**, Terre Haute, Ind.

SAND-LIME BRICK PLANT—Capacity 15,000 per day. Whole of last year's output sold at \$11.00 per thousand. Will sell whole or part interest, or stock in the company with view of increasing the capacity. Full particulars given on application. Address C 1, care Rock Products.

OR LEASE, the North Adams Lime Works, capacity 100 bbls. per day with plenty of stone for larger capacity. The lime is a high grade finishing lime, situated near Boston & Maine and Boston & Albany railroads. Good trade established and kilns are run all the year. For further information address **HARRY M. FARNAM**, North Adams, Mass.

HALF INTEREST in a progressive cut stone business in a town of 30,000 inhabitants. Reason for selling, leaving the State. The only yard in the city. Address, C 2, care Rock Products.

Good Opportunities!

Hope, Arkansas, now has four railroads with two others making surveys, everything moving steadily upward. Fine climate, water, churches and schools; 4,000 inhabitants, etc.

1st. Fine clay on I. M. & S. Ry. abundant and cheap, one mile from corporation; will make finest pressed brick, and I have samples of same to show you now. Two parties (one of experience will invest a few thousand dollars and manage the plant, if agreeable; he lately made the samples referred to). More capital is wanted to establish a \$25,000.00 plant. Good market and good price.

2nd. Good white fire clay about three miles from Railroad.

3rd. Tiling, flower pot, hanging basket and all such clays to be had five miles from Hope, at low figures.

4th. Good chance for one with experience and capital to establish a cement building block plant and do this line of work, as well as general cement work, here and at many points around Hope.

5th. Good chance for one with experience and capital to establish a monumental plant and work the trade out over all the railroads from Hope; and the country in general.

6th. We have asphaltum and other oil and gas indications near Hope; come and I will show you something and give you leases free.

7th. Many chances here to make money in town property; also in fruit, truck and general farm lands. Come and investigate. See Bradstreet and Dun. Write our banks as to myself. Address **A. P. DYKE**, Hope, Ark.

Before placing your order for any of the following articles it will pay you to communicate with the undersigned and secure their prices.

Treads	Urinal Stalls
Risers	Laundry Tubs
Platforms	Sinks
Blackboards	Tiling, etc.

The Penna. Structural Slate Co.,

EASTON, PA.

For Sale!

Crushing Plant with contract for 100,000 cubic yards of R. R. ballast at good price.

Want to sell on account of death of practical partner. Address,

QUARRYMAN,
Care of Rock Products.

FOR RESULTS

Advertise in the Wanted and For Sale Department of Rock Products. Get in touch with people that are in need of your goods.

"Egyptian Portland Cement" FOR CEMENT BLOCKS

"DEHYDRATINE" TO MAKE THEM DAMP-
AND WATERPROOF

Is a combination worthy of the attention of every cement worker.

Both distributed by

J. E. BARTLETT CO. : : : Jackson, Mich.

Take Time by the Forelock

Get a Kritzer Continuous Hydrator

If you want to do a rousing lime business in the spring, you've got to begin to get ready for it NOW. Get your plant up and get busy hydrating. Let the people know you mean business, and that you've got the stuff to sell. Spread the news all about you everywhere. Let the builders and everybody who uses lime know how much better hydrated lime is than the old-fashioned kind. Show them how much more convenient hydrated lime is to handle, how much easier it is to work and how much more economical it is. Do you know that plaster and mortar from hydrated lime gains increasing strength with age? Well, it does. The older it gets, the stronger it is.

Hydrated lime can be used in more ways than lump lime can. You can sell much more hydrated lime than you ever could of the other kind, and there's no chance for loss on it. It don't air slack. It don't swell and burst the bag. As little or as much may be used as needed, and the rest will keep good for years.

We'll be glad to tell you all about it. It won't cost you more than a postage stamp to find out. The man who never investigates new things never accomplishes much in this world. It's the man who is up and doing and gets there before everybody else does—he's the man who reaps the harvest. There will always be money in hydrated lime, because hydrated lime is as staple as flour; but the men who get into the field early are the men who are going to get the bulk of the trade.

We are makers of machinery for hydrating lime. We will furnish you anything from a sprocket wheel to a complete plant, and guarantee whatever you get from us to be the best of its kind in the country. We have the most up-to-date and successful method. Our machinery is tried and tested, and we've had more real experience in this business than all our competitors put together. That's a broad statement, eh? Well, We Can Prove It.

You can't afford to wait. Write Us Now.

Ask For Our Little Book.

*The Kritzer Company,
Western Ave. & 17th St.,
Chicago, Ill.*

CAROLINA PORTLAND CEMENT CO.

We are the largest distributors of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere.

Also Southern agents for the "Dehydratine's" waterproofing material. "Universal," "Acme" and "Electroid" Brands Ready Roofing. Get our prices.

CHARLESTON, S. C.
ATLANTA, GA.

BIRMINGHAM, ALA.
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Red, Brown,
Buff and Black
MORTAR
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The Strongest and Most Economical in the Market.

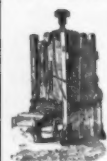
Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.,

CHATTANOOGA,
TENNESSEE.

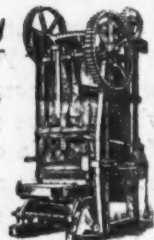
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Yard Supplies of all Kinds



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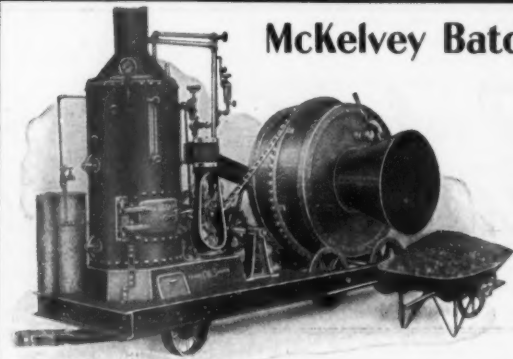


"MARTIN"
DRAWN 807
LANCASTER, PA.

Peirce
City
White
Lime



McKelvey Batch Mixer



Does not dump under drum and frame. Note the long discharge spout. Its object and advantages explained in new booklet, ask for it. Once used no other is good enough. All sizes.

McKELVEY CONCRETE MACHINERY CO., 171 La Salle St., Chicago, 1215 Filbert St., Phila. Pa.

W. D. MEYER,

Manufacturer of

Marble White Lime

115 Delaware Street, QUINCY, ILL.

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FOR

QUARRY AND MINERAL PROPERTY.

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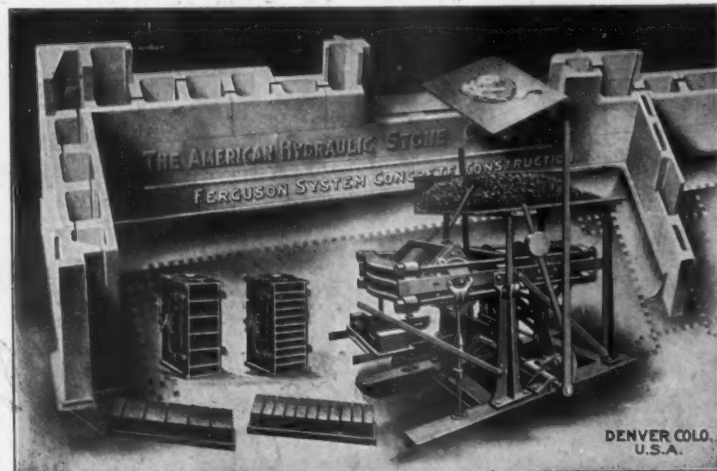
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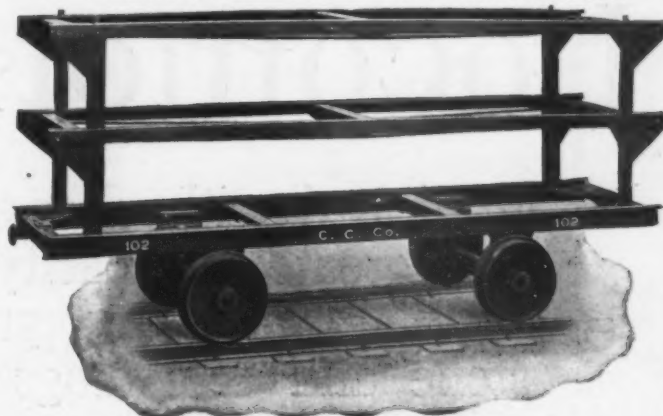
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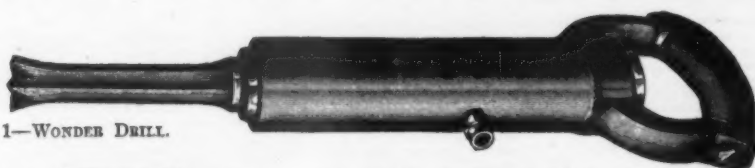
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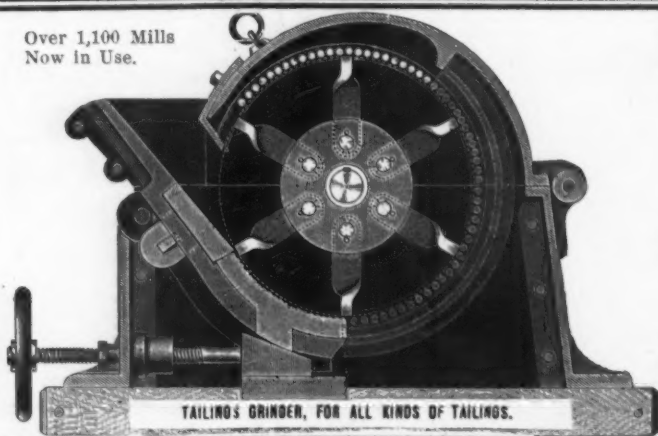


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OOLITIC LIMESTONE.

Bedford Quarry Co., The
Bedford Steam Stone Co.
Brooks-Curtis Stone Co.
Consolidated Stone Co.
Furst, Kerber Stone Co.
Indiana Bedford Stone Co.
McMillan, W. & Son
Oolitic Stone Co. of Indiana
Perry-Matthews-Buskirk Stone Co.
Rosa, John
Hoadley Stone Co.
Empire Stone Co.
Dugan Stone Co.
Hoadley, L. J. & Sons

PATENTS.

Shepard & Parker

PLANERS.

Birmingham Iron Foundry
Johnston, August
New Albany Mfg. Co.
F. R. Patch Mfg. Co.

PLASTER.

Concrete Engineering and Equip.
Elyria Wood Plaster Co., The
Grand Rapids Plaster Co.
Iowa Plaster Co.
New Albany Wall Plaster Co.
Plymouth Gypsum Co., The
Sacket Plaster Board
U. S. Gypsum Co.
Wheeling Wall Plaster Co.

PLASTER MACHINERY.

C. O. Bartlett & Snow Co.
Butterworth & Lowe
Dunning, W. D.
Eraham, J. B. & Sons, Mfg. Co.

PNEUMATIC TOOLS.

Dallett, Thos. H. Co.
Chicago Pneumatic Tool Co.
Hardsoc Wonder Drill Co.
Howell Lining Tool Co.
Ingersoll-Rand Co.
H. G. Kotten Co.
Sullivan Machinery Co.
Trow & Holden

PULVERIZERS.

C. O. Bartlett & Snow Co.
J. R. Aising & Co.
Kent Mill Co.
Raymond Bros. Co., The
Stroud, R. H. & Co.
Sturtevant Mill Co.
Williams Patent Crusher and Pulveriser Co.

PUMPS.

Pulsometer Steam Pump Co.

QUARRY SUPPLIES.

Mulconroy Co.

RAILROAD MATERIAL.

Atlas Car and Mfg. Co., The
Broomell-Schmidt & Steacy Co.
Koppel, Arthur & Co.
Watt Mining Car Wheel Co.
Woonham-Major Eng. Works

ROOFING MATERIAL.

Garry Iron and Steel Co., The
Southern Roofing and Paving Co.

RUBBING BEDS.

Lincoln Iron Works
New Albany Mfg. Co.
Wm. J. Oliver

SAND-LIME BRICK MACHINERY.

American Clay Working Mach. Co.
American Sand-Lime Brick Co.
Illino-Constructors & Supply Co.
National Brick Machinery Co.

SAND PUMP.

Allis-Chalmers Co.
Fronier & Son

SAWS DIAMOND.

Anderson, Geo. & Co.
Patch, F. R. & Co.

SCREENS.

Allis-Chalmers Co.
C. O. Bartlett & Snow Co.
Butterworth & Lowe
Des Moines Mfg. & Supply Co.
Eraham, J. B. & Sons Mfg. Co.
Jeffrey Mfg. Co.
John O'Laughlin
Power and Mining Machinery Co.
Tyler, W. S., Co.

SCULPTORS.

Hissi Bros.

SLATE.

McKenna, David
New York Consolidated Slate Co.
Pennsylvania Structural Slate Co.

SOAP STONE FINISH.

American Soapstone Finish Co.

STONE.

Caden Stone Co.
Carthage Superior Limestone Co.
Carthage Building Stone Co.
Carthage Marble & White Lime Co.
Carthage Stone Co.
Carthage Quarry Co.
N. E. Bolle Cut Stone & Contracting Co.
Myers Stone Co.
Spring River Stone Co.

STONE WORKERS SUPPLIES.

Bowers, R. C., Granite Co.
Harrison Supply Co.

STONE SAWS.

Lincoln Iron Works
New Albany Mfg. Co.
West Leeburg Steel Co.

STONE TOOLS.

Ingersoll-Rand Co.

STONE WORKING MACHINERY.

Chicago Pneumatic Tool Co.
George Anderson & Son
Aug. Johnston
H. G. Kotten Co.
Lincoln Iron Works
New Albany Mfg. Co.
F. R. Patch
Stone Working Machine Co.
Steam Stone Cutter Co.

STUCCO RETARDER.

Chemical Stucco Retarder Co.

TURN TABLES.

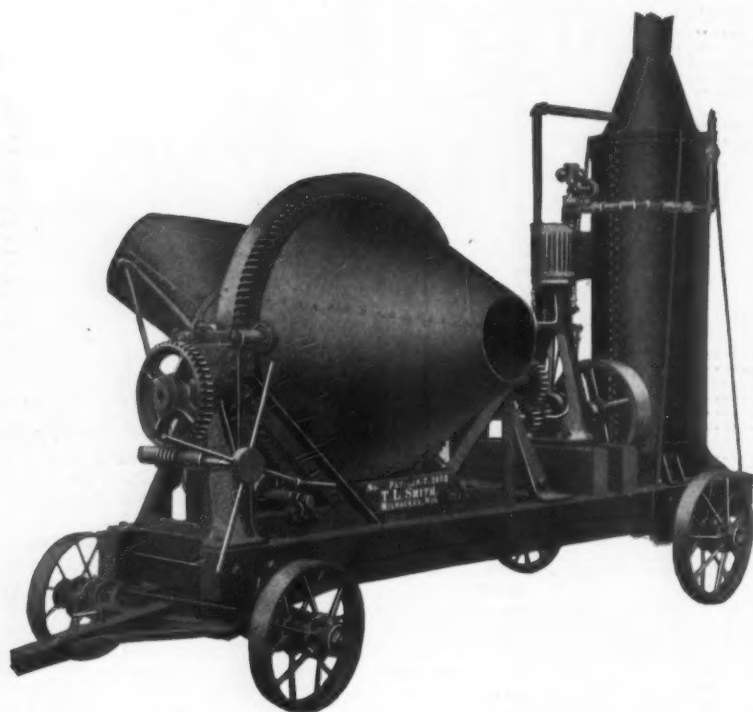
Broomell, Schmidt & Steacy

TUBE MILLS.

Allis-Chalmers Co.
J. R. Aising Co.

WIRE ROPE.

Macomber & Whyte Rope Co.
Steam Stone Cutter Co.



What is Mixing?



Mixing is tearing two particles of the same material apart, and placing a particle of a different material between them.

Blades in a mixing drum act as disintegrators. They help tear the particles apart, thereby permitting other particles to fall between them, and thus producing a thorough and uniform mixture.

Disintegration must always precede mixing. It assists mixing.

This is the Way the Smith Mixer Mixes

Kneading is Not Mixing. Some mixers subject the aggregates to a kneading process, and then claim that they mix.

WRITE FOR CATALOG

Contractors Supply and Equipment Company

Main Office, 520 Old Colony Building, CHICAGO, ILL.

WHY?

Why are the Palmer Lime & Cement Co.'s Limes in demand?
Why are they used in all principal buildings in New York,
Brooklyn, and neighboring Cities?

Because they are the best.

Best for finishing.

Best for brick and stone work.

For finishing, because they will not pit, will not follow the
trowel, and work smooth and clean.

For brick and stone, because they are strong, large yielders, and
will lay more brick per barrel than any other lime on the
market, therefore they are cheaper for the mason's use.

We are Sole Distributers of the—

Cheshire finishing lime, which is well known and always A 1.

Palmer select finishing, fully guaranteed.

Palmer No. 1 common, high grade for brown and scratch coats
and brick work.

Yorktown Heights lime

Connecticut White lime

Hoosac Valley lime

Hadsell White lime

} Especially adapted to brown and scratch
coats and unequalled for brick
and stone work.

And—

Palmer Chemical Lime, which has a universal reputation analyzing
over 99% Pure Carbonate.

We succeed in pleasing our customers.

The Palmer Lime & Cement Co.

FOSTER F. OOMSTOCK, Manager

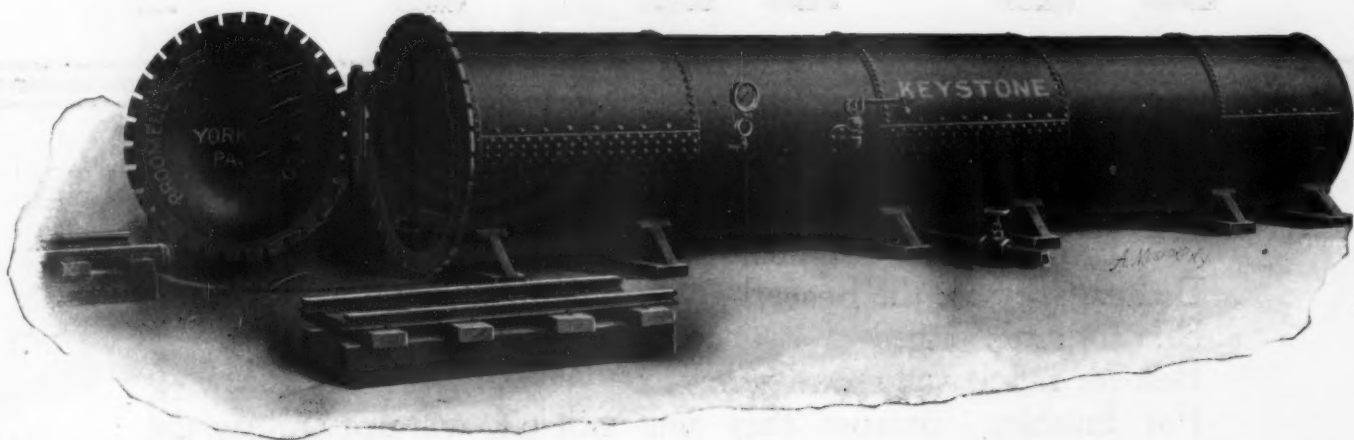
Tel. 6610, 6611, 6612 Cortlandt.

149 Broadway, New York City.

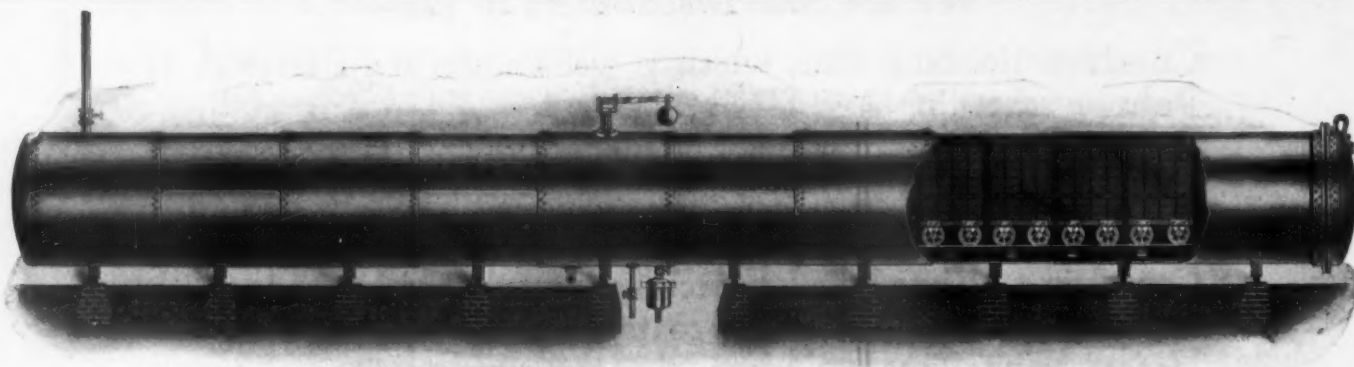
Sand-Lime Brick Hardening Cylinders

BINS, ELEVATORS, CARS, HYDRATING MACHINES.

SPECIAL WORK OF ANY KIND BUILT FROM BLUE PRINTS.



BROOMELL, SCHMIDT & STEACY CO., YORK, PA.



Sand-Lime Brick Machinery

Our Sand-Lime Brick Machinery is at least a little better than any other. We have testimonials to show it. We build it all in our own factory and are sure of its quality. We are the only firm doing this. We will design and equip your entire plant or will sell you parts of your equipment. Our catalog describing and illustrating our full line will be sent upon request.

We also build a full line of machinery and appliances for making Clay Products, Cement and Pottery, Dryers and Dryer Apparatus.

Everything we sell we make. We therefore know its quality to be right.

The American Clay Machinery Co.,
WILLOUGHBY, OHIO, U. S. A.

Tell 'em you saw it in ROCK PRODUCTS.

CEMENT-KILNS

Lined with Our **BAUXITE** Lining Blocks

In hot zone and our special fire-clay blocks throughout the rest of Kiln can be run from three to four times as long as Kilns lined with the very best fire-clay linings. Write for booklet describing Bauxite Linings for Portland Cement Rotary Kilns.

Fire-Brick for Lime Kilns

We number among our customers many of the large Lime and Gypsum Manufacturers of the Country.

Sewer Pipe, Wall Coping, Hollow Tile
Fire Proofing, Flue Lining.

Laclede Fire-Brick Manufacturing Co.
ST. LOUIS, MO.

Gypsum Machinery

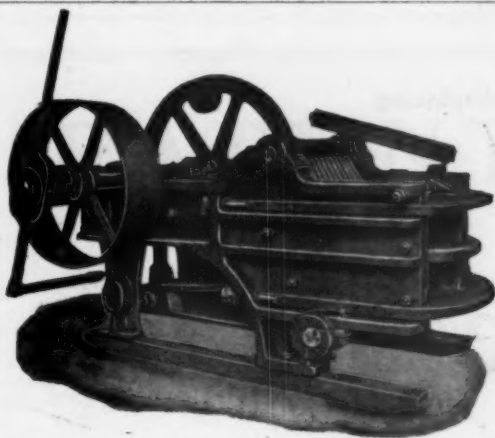
A fine and complete line of Modern Machinery.

KETTLES, CRUSHERS, NIPPERS, ETC.

We are now building the new Plymouth Mill at Fort Dodge, Iowa, the finest mill in the United States.

ASK FOR CATALOGUE.

Des Moines Manufacturing and Supply Company
DES MOINES, IOWA.



CRUSHERS

for soft rocks, burnt lime, etc.

GYPSUM MACHINERY.

We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting etc.

SPECIAL CRUSHER-GRINDERS FOR LIME HYDRATORS.

BUTTERWORTH & LOWE

17 Huron Street, GRAND RAPIDS, MICH.

Tell 'em you saw it in ROCK PRODUCTS.

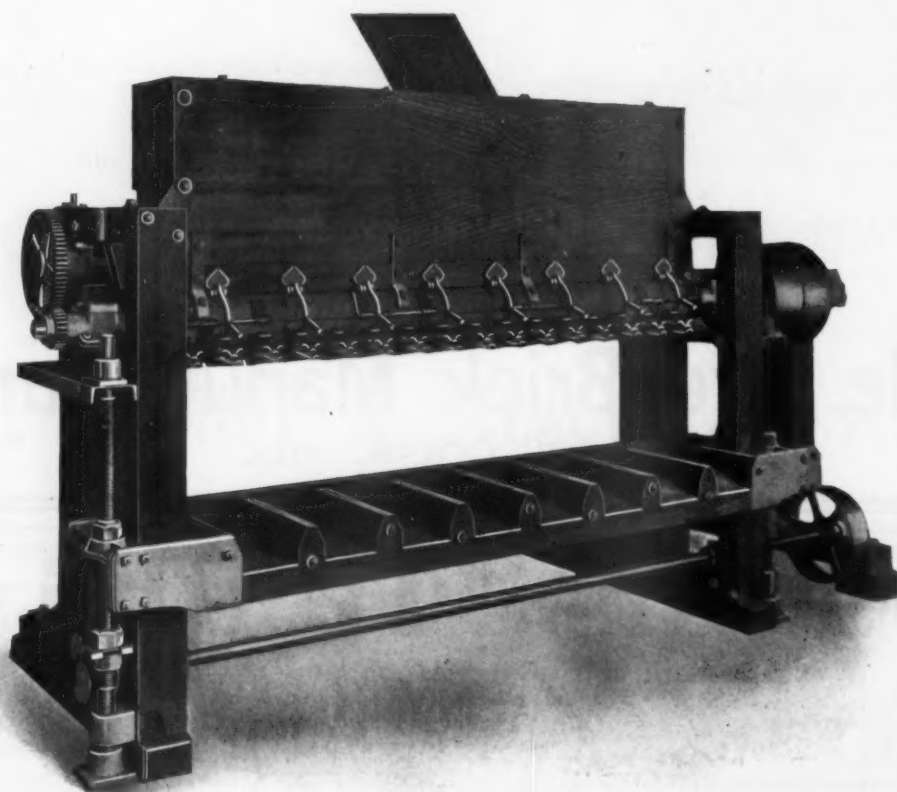


THE BATES VALVE BAG

Reduces the cost of handling Hydrated Lime.

Automatically Fills and Closes the Package

With a Minimum of Labor and Expense.



BATES SYSTEM BAG FILLING MACHINE, AS APPLIED TO HYDRATED LIME.

This company has already placed a large number of machines since its organization, and while as yet not all of the machines are in operation, those that are have consumed over a million valve bags, which certainly speaks for the success of our automatic device.

We now have an automatic weighing device which can be adjusted to any number of pounds wanted and which closes off automatically when the desired weight is obtained. We also have a tying device which ties automatically twenty bags per minute, which uses only 50 per cent of the bag twine and of a cheaper grade than that used in the old method of tying by hand.

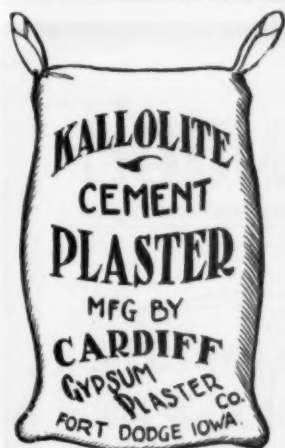
No lime manufacturer can afford to be without our automatic bag-packing devices.

**Paper Bags are filled with material without displacing
air at atmospheric pressure.**

Attractive Proposition Now Ready For Your Investigation.

Urschel=Bates Valve Bag Co.,

TOLEDO, OHIO.



KALLOLITE CEMENT PLASTER

IS MANUFACTURED FROM
THE PUREST GYPSUM ROCK
FOUND IN THE UNITED STATES
AS SHOWN BY GOVERNMENT
REPORT.

CARDIFF GYPSUM PLASTER CO.
MANUFACTURERS FORT DODGE, IOWA

Plaster! Plaster!

IOWA HARD PLASTER CO.



HARD BY NAME
HARD BY NATURE
HARD TO BEAT
NOT HARD TO GET



IOWA HARD PLASTER CO., Ft. Dodge, Iowa.

Empire Gypsum Company

The Empire Gypsum Company's new mill,
with capacity of 200 tons daily, is in
operation and they are prepared to
promptly furnish the best quality of Em-
pire Stucco, Empire Neat Plaster, Sterl-
ing Wood Fiber Wall Plaster and Ex-
celsior Wall Plaster Sanded.

Garbutt, Monroe County, New York.

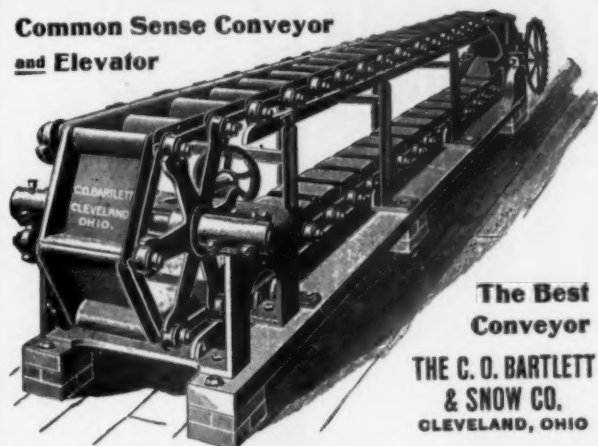
CUMMER CONTINUOUS PROCESS FOR Calcining Gypsum



No Kettles Used. Plants in Operation.
Great Saving in Cost of Manufacture and Quality of Product
Guaranteed.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Common Sense Conveyor
and Elevator



The Best
Conveyor

THE C. O. BARTLETT
& SNOW CO.
CLEVELAND, OHIO

PATENTS

C. L. PARKER,

Attorney-at-Law and Solicitor of Patents

146 Deitz Bldg., Washington, D. C.

Patents secured promptly. Trade Marks registered. Re-
ports rendered as to patentability, validity and infringe-
ment. Hand Book for inventors sent free upon request.

The STROUD MILLS OUTDO ALL OTHERS

In quality of grinding and in output per horse-power per
hour on most kinds of work, and they
grind for less money per ton.



Our Air Separation Pul-
verizers produce direct from
mill, any desired mesh, from
say 40x40 down to the most
impalpable powders, at will
of operator, at a moment's
notice. Dustless in operation.
Do away with sieving
entirely.

We build Screen Separation
Mills too.

Catalogue on request.

E. H. STROUD & CO.

ENGINEERS & MANUFACTURERS

30-36 LaSalle Street, CHICAGO, U. S. A.

tell 'em you saw it in ROCK PRODUCTS.

J. B. EHRSAM & SONS MFG. COMPANY

Machinists and Founders



Enterprise, Kansas

Invite the careful attention and inspection of

Plaster Manufacturers Everywhere

to some new machines especially designed to meet the requirements of the present progressive period. They demonstrate economies and advantages that have long been needed.

**Pictures and Details Right Here
Next Month===Look for It**

Something New Under the Sun

A Plaster Finish Without Lime
and Without its Troubles

As Different from Lime as
Marble is from Chalk



A Plaster
Product as Big
as the Market is Wide

A Market
as Wide as
the need is Great

UNITED STATES GYPSUM CO.

CHICAGO

CLEVELAND

MINNEAPOLIS

HIGHEST AWARD
ST. LOUIS EXPOSITION
1904.

RED, BROWN,
BUFF, PURPLE,
BLACK.

For Brick, Mortar, Cement, Stone, etc.

The RICKETSON MINERAL COLORS
COLOR
QUESTION SETTLED

FOR QUALITY AND STRENGTH
WE LEAD.

RICKETSON MINERAL PAINT WORKS, Milwaukee, Wis.

H. L. Graf, Pres. E. T. Slider, Vice-Pres. & Gen'l Mgr. Osborne G. Reilly, Sec. & Treas.

New Albany Wall Plaster Co.

(Incorporated.)

MANUFACTURERS OF

Star and Wood Fiber Wall Plaster.

NEW ALBANY, IND.

We wish to announce to the trade that we are now running and at the present time, are in position to fill all orders promptly. Those who have used our goods claim it is the finest they ever had.

If you have not tried it, we are sure it would be to your interest to do so.

Prices always right and your orders solicited.

NEW ALBANY WALL PLASTER CO.,

NEW ALBANY, IND.

Cumberland Phone 408.
Home Phone 137.

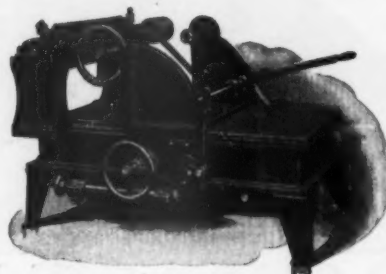
Garry's Genuine Charcoal Iron Roofing

WILL NOT RUST

If properly cared for. Roofs put on forty
and fifty years ago are now good.

Manufactured Exclusively by
THE GARRY IRON AND STEEL CO.
CLEVELAND, OHIO.

The Leonard Wood Fiber Machine



Has an Automatic, Proportional, Increasing Feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors but write for descriptive circular and terms to

The Shuart-Fuller Mfg. Co.

Successors to

The Elyria Machine Works,
Elyria, Ohio

ELYRIA MACHINE WORKS, Elyria, Ohio

Gentlemen:—We are very much pleased with your machine, as is evidenced by the fact that we are ordering the second one from you. This last machine will take the place of a machine, which we have found takes more power to run, with about one-third the output of your machine.

S. A. WALKER, Vice Pres.
Acme Cement Plaster Co., St. Louis, Mo.

THAT'S IT



Cement Plaster
Wood Fiber Plaster

The Brand that's Made from Pure Gypsum Rock.

Correspondence Solicited.

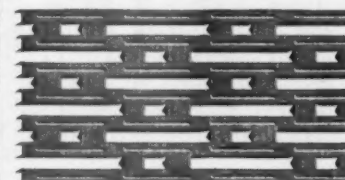
MANUFACTURED BY

The Plymouth Gypsum Co.

FORT DODGE, IOWA



TRUSS LATH.
THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO.



CLINCHER LATH.

SOLID PARTITIONS
ERECTED WITHOUT
STEEL STIFFENING RODS
are
ABSOLUTELY FIRE-PROOF
TRUSS LATH

is
BEST FOR STUCCO WORK,
LIGHT FLOOR SLABS, ETC.

CLINCHER LATH
LEADS
AS A PLASTER SAVER.
SMALL KEY-LEVEL
SURFACE.

Strong, Rigid, Durable.
Write for Samples.

STUCCO RETARDER

THE Oldest, Why
Strongest, Why
Best, Why **?**

BECAUSE IT IS MADE BY

Chemical Stucco Retarder Co.
WEBSTER CITY, IOWA

Our new Air Separation plant gives us the most uniform Retarder made. Write for sample, and let us prove it.

PATENT SOAPSTONE FINISH

PLAIN AND IN COLORS FOR WALLS AND CEILINGS.

Patent Soapstone Mortar.

Prepared in any Color for Laying Pressed and Enamelled Brick, Stone Fronts, Terra Cotta, Chimneys, Fire Places, Etc.

The Dodge Blackboard Material or Artificial Slate.

The Potter Blackboard Material.

SOAPSTONE MICA, CONCRETE DRESSING.
CRUSHED, GROUND AND BOLTED SOAPSTONE.

AMERICAN SOAPSTONE FINISH CO.
G. P. DODGE, Proprietor. CHESTER DEPOT, VT.

Tell 'em you saw it in ROCK PRODUCTS.

RESIDENCE OF CHARLES F. BOOD,
GRAND RAPIDS, MICH.

CHEMISTRY BUILDING, UNIVERSITY OF WISCONSIN.
MADISON, WIS.

RESIDENCE OF CHAS. W. WRIGHT,
GRAND RAPIDS, MICH.



These buildings were made better: your building can be made better by using
SACKETT PLASTER BOARD INSTEAD OF LATH

Sackett Plaster Board is a building material that should command the attention of every man who is interested in good building construction. It is displacing wood and metal lath in edifices of every type, and has earned the unqualified commendation of architects and builders everywhere. Every architect owes it to his clients, every owner owes it to himself, to investigate this material before making old-style specifications.

Sackett Plaster Board has succeeded, and is succeeding, because it is something more than a mere base to hang plaster on—it offers advantages and gives results that are not obtainable in any other way. It makes a warmer wall than wood lath, is cheaper than metal and resists fire far better than either.

The New Way.

Sackett Plaster Board consists of alternate layers of felt and stucco rolled into sheets which are nailed to the studding, presenting a hard, smooth surface to which the plaster adheres perfectly. The board being non-inflammable, the result is a wall or partition that the underwriters will pass as "slow-burning" construction, that retains heat, excludes cold, and that is an effective sound deadener. These and other advantages have kept the demand exceeding the supply for several years past, and the board has never before been advertised. Two new factories have recently been erected, however, and Sackett Plaster Board is now on sale in building material yards throughout the country. Address of nearest dealer furnished on application.

The Old Way

Sackett Plaster Board

is not merely a substitute for lath. It can be used to good advantage somewhere in every building that is put up.

Sackett Plaster Board is an excellent fire retardant and sound deadener and can be used between floors to excellent advantage. It has also been used a great deal for sheathing, and those who have tried it are enthusiastic over the results. Tar paper used in ordinary sheathing usually cracks when the heat is turned on. Sackett's Plaster Board gives a warm, tight wall, and costs 25 to 50 per cent less than lumber and paper.

When used in interior work the plaster is put on with half the usual amount of water, which not only saves time (often an important consideration) through quicker drying, but reduces the warping and shrinking of timbers and trim. The finished wall is hard and firm, can be depend-

ed upon not to warp or crack, and the ceilings are not subject to the streaks caused by porosity of the "clinch" as in ordinary lathing.

In warehouses and commercial plants the fireproof and insulating properties of Sackett Plaster Board can be utilized in many ways—between floors, as a covering for exposed metal surfaces, and as a non-conductor in the casings of kilns and refrigerating plants.

The State Insane Asylum at Binghampton, The Marlboro Hotel at Asbury Park, The Savoy Theatre, New York, the United States Naval Academy at Annapolis, are types of buildings in which it has been used successfully and economically.

Results Considered. Sackett Plaster Board is the cheapest building material ever made. And its first cost, in many cases, is no more than is paid for antiquated, inflammable and unsatisfactory lathing.

This advertisement, necessarily, gives but a suggestion concerning Sackett Plaster Board, printed in the hope that it will interest those who contemplate building. If you are interested, and would like to know all about it, without obligation.

Drop a line today to any of the following distributors.

UNITED STATES GYPSUM COMPANY,
CLEVELAND, CHICAGO, FT. DODGE

GRAND RAPIDS PLASTER COMPANY,
GRAND RAPIDS, MICHIGAN

SACKETT PLASTER BOARD COMPANY,
17 BATTERY PLACE, NEW YORK CITY



The Only Fire-Proof Sand for Cement Brick and Blocks

THE IDEAL SAND FOR SAND-LIME BRICK
 THE BEST SAND
 GLASS MANUFACTURING FOUNDRY PURPOSES
 GLASS BEVELING STONE CUTTING
 PLASTERING AND CONCRETE
 PURE WHITE AND BUFF
 99% Pure Silica
 THE BEST OF KNOWN
 CORE SANDS.
 KENTUCKY SILICA COMPANY, LOUISVILLE, KY. MINES ON I. C. R. R. AT
 TIP TOP, KENTUCKY.

WHEELING WALL PLASTER CO.,

MANUFACTURERS AND JOBBERS

Wheeling Plaster and Builders Supplies.

WHEELING, - - WEST VIRGINIA.



DRYERS
 OF EVERY TYPE
 CONSTRUCTED FOR ALL PURPOSES.
 AGENTS FOR BISHOP WATER JACKETED FURNACE FRONTS.
 UNITED STATES DRYING ENGINEERING CO.
 66-70 BEAVER ST., NEW YORK, U.S.A.

SPECIAL MACHINERY AND FORMULAS

FOR THE MANUFACTURE OF

WOOD FIBER PLASTER, FIRE PROOF-
 ING AND KINDRED PRODUCTS.

We furnish the latest improved FIBER MACHINE, (fully patented),
 also FORMULAS, on a reasonable proposition. The strongest compa-
 nies and oldest manufacturers are operating under my contracts.
 WRITE FOR TERRITORY.

The Ohio Fiber Machinery Co.

J. W. VOGLESONG,
 GENERAL MANAGER.

Elyria, Ohio.

KING'S WINDSOR CEMENT FOR PLASTERING WALLS AND CEILINGS

Elastic in its nature, can be applied with 25 per cent. less labor and
 has 12½ per cent. more covering capacity than any other
 similar material.

Buffalo Branch: CHAS. C. CALKINS, Manager
 322 W. Genesee Street

J. B. KING & CO., No. 1 Broadway, New York

METAL LATH

Bostwick Expanded Metal
BOSTWICK FIRE-PROOF STEEL LATH

For Plaster Walls and Ceilings, Concrete Re-
 inforcement. Our Flat Lath the Stiffest and
 Most Economical Metal Lath on the Market.
 WRITE FOR SAMPLES AND PRICES.

BOSTWICK STEEL LATH CO.,
NILES, OHIO.

Blue Rapids Gypsum Co.'s Mill

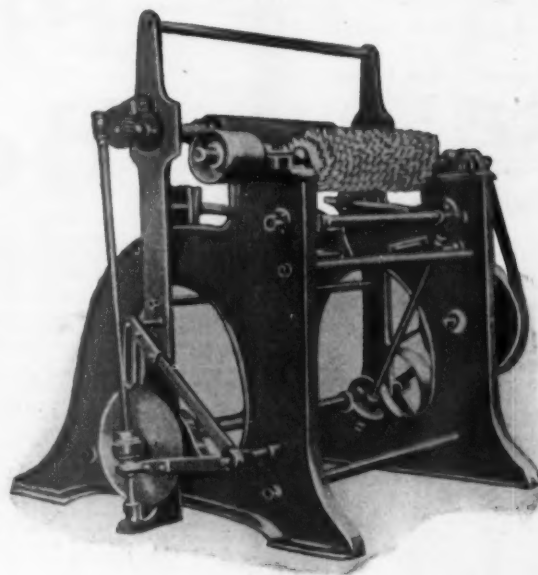
will start September 1st. Capacity two hundred
 tons daily. They have an eight-foot vein of Gyp-
 sum and will be ready to fill all orders quickly,
 as they have the best equipped mill in the country.

—ADDRESS—

Blue Rapids Gypsum Co.
BLUE RAPIDS, KANSAS.

'The Cochran' Automatic Wood Fibre Machine

(PATENTS PENDING)



There is positively nothing cheap or shoddy about this machine, either in workmanship or
 material. There are no Sprocket Wheels or Chains, no Cone Pulleys or Cog Wheels to break, get out of
 order and cause trouble. All the power is transmitted with bevel gears adjusted to "run like a
 watch."

We call special attention to the "speed increasing mechanism" and automatic action of our
 machine. When the log is reduced to the size of 2 inches the carriage is automatically released,
 and swings back to place without being touched by the operator, while at the same time the log
 stops revolving, without interfering with the other parts of the machine.

The log when finished is revolving six times as fast as at the start and all done automatically
 and continuously.

Write for catalogue and prices to

Concrete Engineering and Equipment Co.

Butler, Pa.

Greensboro, N. C.

Tell 'em you saw it in ROCK PRODUCTS.

Does quality appeal to you?

Does prompt service appeal to you?

Does reliability appeal to you?

Then buy your Stucco
AND
your Wall Plasters of

The
American Gypsum Co.

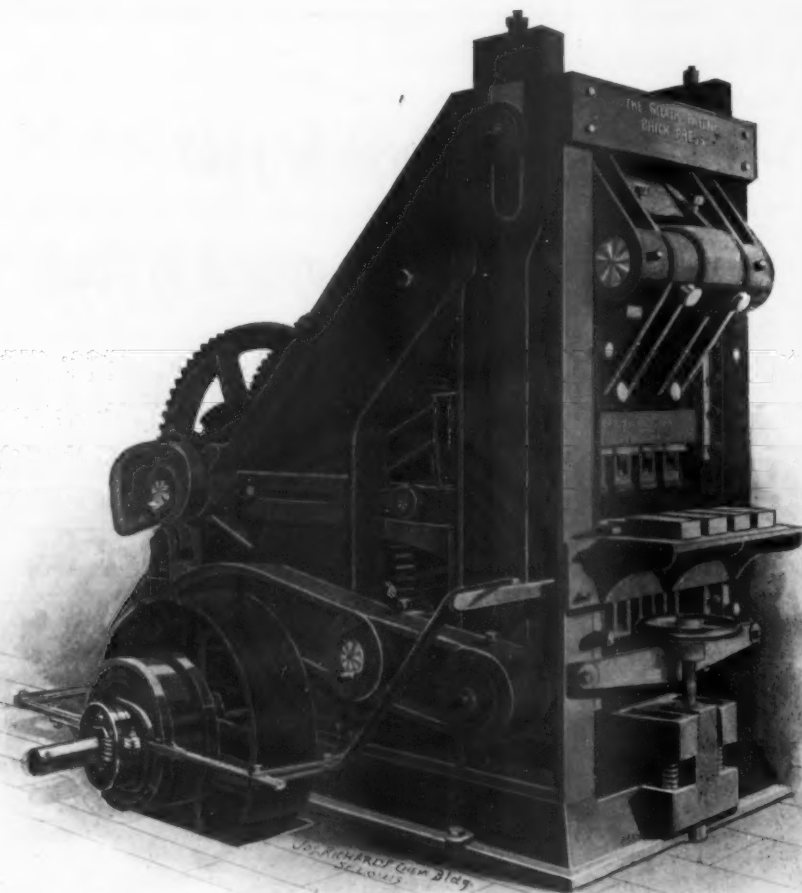
MANUFACTURERS OF
HIGH GRADE STUCCO. "ANCHOR" CEMENT PLASTER.
"ANCHOR" WOOD FIBRE PLASTER.
SUPERFINE CALCINED PLASTER.

General Offices: Garfield Building, CLEVELAND, OHIO
Mills: Port Clinton, Ohio

The Grath Four Mould Special Brick Press

For Sand-Lime Brick of Highest Grade,
also for Highest Grade Dry Press Brick.

Built in
Two, Three,
Four and Five
Mould Sizes



Only Press
Built on Cor-
rect Principles,
Only
Modern Press



Simplest and Best as Well as most Powerful Brick Press ever built. Guaranteed to make better brick than any other Press and to give complete satisfaction. Guaranteed against breakage. Only Press Free from Side and Cross Breaking Strain. Impossible to strain or twist crank shaft. ∴ ∴ ∴

FOR PRICES AND PARTICULARS, APPLY TO

Illinois Supply and Construction Company

Suite: 512 and 513 Colonial Security Building

ST. LOUIS, MO.

All agreements contingent upon strikes, accidents or other causes beyond our control.
All agreements, contracts and sales must be approved by J.W. Sanderson, General Manager.



THE UNITED

CEMENT MACHINERY MFG. CO.

GENERAL OFFICES & SHOPS - COLUMBUS, OHIO, U. S. A.



1906 INC

OFFICERS	SUCCESSORS TO & MANUFACTURERS	MANUFACTURERS OF
<p>H. S. PALMER PRESIDENT</p> <p>J. F. ANGELL 1ST VICE PRES. AND TREAS.</p> <p>J. W. SANDERSON 2ND VICE PRES. AND GENL. MGR.</p> <p>J. M. McDOWELL SECRETARY</p>	<p>UNDER PATENTS OF</p> <p>H. S. PALMER CO. WASHINGTON, D.C.</p> <p>WINGET CONCRETE MACHINE CO. COLUMBUS, OHIO.</p> <p>CEMENT MACHINERY MFG. CO. BURLINGTON, IA.</p> <p>AND VARIOUS OTHERS</p>	<p>SIDE FACE BLOCK MACHINES, FACE DOWN BLOCK MACHINES, CONCRETE MIXERS, SIDE WALK BLOCK MACHINES, CEMENT BRICK MACHINES, ROOF TILE MACHINES, CEMENT BLOCK CARS, CEMENT TILE MOULDS, CAP AND BALL MOULDS, SPECIAL MOULDS, PNEUMATIC TAMPERS, CAST PALLETS ANY SIZE, BRIDGE SIDEWALK TOOLS, NAME STANDS AND LETTERS, WEATHERPROOF COLORS</p>
BRANCH	AND VARIOUS OTHERS	OFFICES
<p>NEW YORK CITY 400 W. 33RD ST.</p> <p>WASHINGTON, D.C. 1400 CHURCH ST.</p>	<p>BOSTON, MASS. 101 HILK ST.</p> <p>BURLINGTON, IA. 412 E. BROAD ST.</p>	<p>PASADENA, CAL.</p> <p>LOS ANGELES, CAL.</p>

In our Warerooms of 33,000 Square Feet Area, we carry 40 different kinds of machines used in the Concrete Block Industry and Associated Work.

We have Hollow Block Machines from \$21.00 up, the prices varying according to the outfit and grade. They include the most perfect machines ever produced. Our several types of Concrete Mixers are the best that money will buy.

OUR OFFER:—In order that you may carefully examine our complete lines and choose just what you want, we will gladly pay your railroad expenses and practically operate any or all of the machines in our demonstrating department, then if we cannot satisfy you fully as to their merit and price we will pay your fares just the same.

Or, if you purchase a machine direct we will send a practical demonstrator to start your plant.

Write us to-day for our 80-Page Catalog. Department C.

The United Cement Machinery Manufacturing Co.
Maple and Front Streets COLUMBUS, OHIO



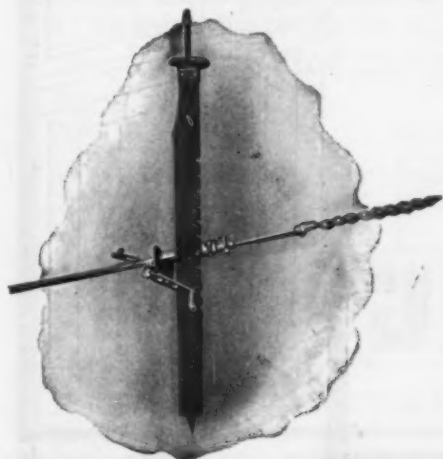
The Sanders Brick Machine

For making sand and cement brick, sand and lime brick, any brick, all shapes and sizes. This machine makes the finest face brick of any machine on the market; every brick is perfect with fine, smooth face and sharp, square edges, every brick a pressed brick. This machine makes plain brick, ornamental brick; molded brick, all shapes and sizes, building blocks, rock face, tool face, panel face, plain face with V joint and brick face, fancy belt courses, corner blocks, combination brick cornice, fine porch columns, porch piers, lattice work, wall trimmings, chimney tops, paving block, archways, wainscoting and tiling for vestibules and hallways, stair steps and risers figured and paneled, for inside and outside stairs, also many figures in terra cotta work can be made on this machine, and made any color by using the chemical coloring.

Two men can make 4,000 to 6,000 brick a day, 1 1/2 bbls. of cement to 1 1/2 yds. of sand will make 1,000 good brick; 2 bbls. of cement to 1 1/2 yds. of good, fine sand will make 1,000 fine face brick, style and variety of work unlimited. It pays every time to buy the best machine. With good sand and good cement you only need one of our machines to make the best and finest cement work that can be made. Send for our catalogue in which you will see cuts made from work on this machine—seeing is believing—it is acknowledged by experts to be the best machine on the market for cement work. Be sure that you are right, then buy our machine which makes everything right.

Catalogue Free.

READING BRICK MACHINERY CO., OFFICE: 405 Baer Building,
READING, PA.



HOWELL'S Celebrated Ball Bearing Heavy Geared Post Drills

for boring anything that
an Auger will penetrate.

Awarded Gold Medal, St. Louis.

We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send to day for our handsomely Illustrated Catalogue.

HOWELL MINING DRILL CO., Plymouth, Pa. U. S. A.
(ESTABLISHED 1878.)

NODAM-PWALL

The Cheapest and Best Waterproofing

Nodam-Pwall—A Fluid Compound has been invented, perfected, tried and found not wanting. When employed to subdue the affinity of seasoned cement brick or block and lime sand brick, to not absorb, but shed RAIN WATER.

Why Not Make a Profit

By Producing a Perfectly
Satisfactory Waterproofing

Compound for your

own Work



This formula now offered for sale for the first time is worth the investigation of all those who want to manufacture the best product at the lowest cost.

EVERY cement user, cement block and brick manufacturer and user, sand lime and brick manufacturer and user, and contractor will profit by purchasing this formula. **The Price is \$5.00**, which must be paid in advance and the signature of the recipient which guarantees the lawful owner of this NODAM-PWALL formula must sign a contract not to reveal the materials used or the mix which composes the formula, or the instructions as to its particular use.

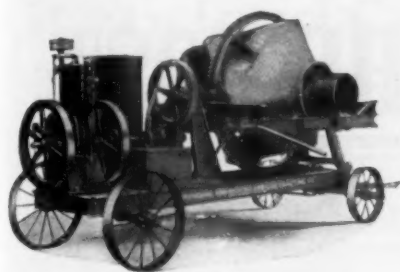
NODAM-PWALL is a winner. It will make you money. The investment is small and by integrity of purpose and the purchase and use of the same you can add to your success for 1907 by SENDING YOUR ORDER AT ONCE, and don't forget the name NODAM-PWALL.

THE ROESLING CO.

233 FIFTH,
LOUISVILLE, KY.

UNPROTECTED
BLOCK

NODAM-PWALL



The Chicago Improved Cube Concrete Mixer

is used by The United States Government Reinforced Concrete Commission, St Louis, for all cement testing purposes

OUR NEW MIXER CHARGING ELEVATOR

not only increases the capacity of the mixer from 25 to 50 per cent., but ABSOLUTELY ELIMINATES all necessity for the building of any kind of platform or runway. THEREBY SAVING 75 per cent. of time lost in moving from one point to another on the work. Sizes and mountings for every requirement. Write for catalogue No. 18.

Municipal Engineering & Contracting Company,
New York Office: 150 Nassau St. 607-611 Railway Exchange, CHICAGO, ILL.

A LINE OR TWO IN THE WANTED AND FOR SALE DEPARTMENT WILL DO THE TRICK.



Double End Convex
Pointing Tools.

16 Sizes—Half
Round or Diamond
Shaped

The Kramer Bros. Foundry Co.

DAYTON, OHIO

Largest Manufacturers of Cement Tools in the United States.

SEND FOR CATALOGUE "G"



Double End Concave Bending Tools
16 Sizes—Half Round or V Shape

Hayden Mixers are Thorough

The Hayden Mixer is a composite of durability, rapidity and economy. The materials are automatically fed. The drum is made of No. 8 gauge steel plate, made in two sizes. The reel is a spiral arrangement of steel knives. Send for Catalog "B"

The Hayden Automatic Block Machine Co.
Columbus, Ohio.

New York and Foreign Office:
Hayden Automatic and Equipment Co.,
26 Cortlandt St., New York City.



To Procure or to Sell Quick—

Try a line or two in the Wanted and
For Sale Department.

Simplicity
Practicability

in

THE X-L CONCRETE STONE MACHINE

A Tested Success from Results of Years of Experience.

is

Efficient
Economical

Guaranteed to Equal in Efficiency any Four Other Machines and Save 20 to 25 per cent. in the Construction of "Dry Walls."

A New Feature—Interchangeable Plates. The same plates can be used on all sides, finishing both the face and outside and inside returns, and can be inverted and intermingled, forming hundreds of different designs and combinations. Our blocks make all width walls, and form all parts of a building, the same as a brick.

Bear in Mind you don't require five or six different size machines to do the work when using our X-L Machine. It makes blocks in 17 different lengths, 2-4 1/2-6 and 9 inch heights; angles and circles, for both full walls and veneering, giving a variety of over 1000 blocks; all made on the one size pallets.

Dry Wall Guaranteed without facing the block, or using face solutions, which are not only troublesome and expensive, but destroys the beauty and natural stone appearance. 10 to 25 per cent saved in material without sacrificing strength. Our Off-Bearing Car and Automatic Loading and Unloading Truck has changed the back-breaking work under the old methods to almost child's play, saving 75 per cent in the cost of handling blocks. We Back Every Statement We Make.

See Catalog For
Prices.

E. E. EVANS, Mgr.

111-113 W. 18th Street,
Kansas City, Mo.



PETTYJOHN CONCRETE BLOCK MACHINE.

THE CHOICE OF THE PRACTICAL
5,000 IN SUCCESSFUL USE

The only machine with which it is possible not to disturb the concrete after it is moulded or while it is setting. Operated on the Pettyjohn system—"Move the Machine, Not the Block." Detachable and interchangeable face plates. Positively guaranteed to be the most labor-saving, simplest, best, fastest and cheapest machine on the market, regardless of price. No carrying of blocks, no expensive iron pallets, no cogs, gears, springs, levers or broken blocks. Sand, water, and cement only materials required. One man can operate. Made in various sizes. Every machine fully guaranteed and we ship on trial, and there are no strings to our trial offering—you alone are the judge of the machine in your own shop. Beautiful catalogue and other information free.



THE PETTYJOHN CO., 614 No. Sixth St., Terre Haute, Ind.

Buy a HAYDEN for STRENGTH as well as RESULTS

The Hayden Automatic and Adjustable Block Machine is the only one on the market strong enough to withstand the heavy strain of pneumatic tamping. Write for booklet of what practical men say on the subject.

Points of Superiority:

Strength. Down Face.
Rapidity. Limitless Range.
Ease of Operation.
Simplicity of Construction

HAYDEN, the standard of excellence. Send for catalog to-day



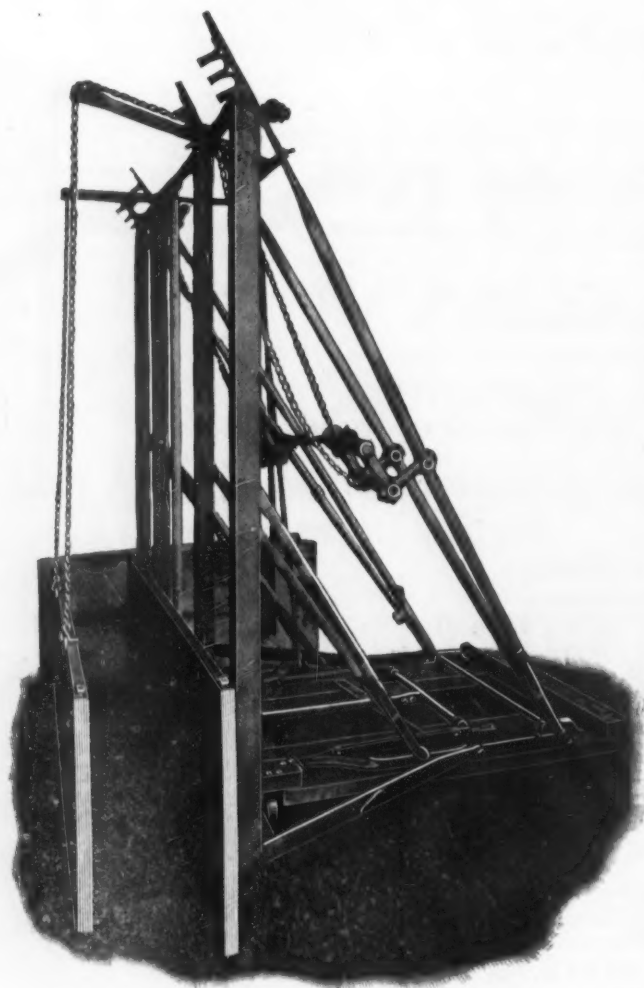
THE
Hayden Automatic Block Machine Co.
Box 705. COLUMBUS, O. 112 W. Broad St.
New York and Foreign Offices:
HAYDEN AUTOMATIC & EQUIPMENT CO.
26 Cortlandt St. NEW YORK.
WESTERN OFFICE: 415 Real Estate Building
821 Chestnut St. ST. LOUIS, MO.

Tell 'em you saw it in ROCK PRODUCTS.

SAVE 75 PER CENT. OF THE COST

BY USING A PAULY CONCRETE WALL MACHINE.

Enormous Economy Guaranteed on Every Job When Used for the Construction of



PAULY'S WALL MACHINE

It often pays for itself at the completion of the first small job.

Foundations, Basements, Cellars and Retaining Walls.

The expense of cribbing or centering amounts to a distinct operation that must be performed by skilled mechanics using costly lumber, with heavy waste in both time and materials. After all this comes the actual concrete work, representing really a small part of the outlay and cost. Yet this is the basis for collecting and your customer's only reason for doing business with you.

We build the only machine that completely dispenses with all of the cribbing or centering in very many concrete jobs. Fully half the work of any contractor, who takes a general line of the ordinary run of concrete work, can be reduced in cost to him at least 75 per cent. by using the Pauly Wall Machine. This means a larger profit and a lower price to your customer at the same time.

The cost of the lumber for centering, the expense of handling the lumber, the delay and cost of carpenter work can be eliminated.

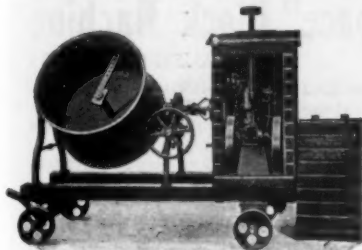
Substantial Contractors are Invited to Investigate. DO IT NOW!

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Concrete Stone & Sand Co.

YOUNGSTOWN, OHIO.

Standard Concrete Machinery



Portable Power Outfits \$270 to \$470, according to size and equipment.

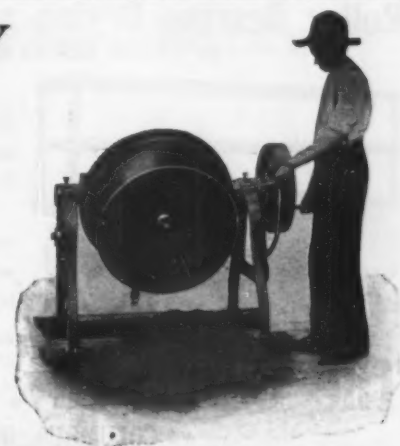
The **STANDARD CEMENT BRICK MACHINE** is the fastest hand brick machine on the market. It will make plain, veneered and ornamental face and shape, all perfect, smooth brick, true to size and design.

The **STANDARD CONCRETE MIXER** handles wet or dry mix, requires little power to operate, mixes batch perfectly in one minute, self-cleaning, easily charged and dumped.

The **STANDARD GAS AND GASOLINE ENGINE** is made in all sizes. Especially adapted to running concrete machinery.

The **STANDARD PORTABLE MIXER AND ENGINE** are mounted on suitable truck, well designed, convenient to operate.

WRITE FOR CATALOGUE AND PRICES.



Hand Power Standard Mixer.

South Bend Machine Mfg. Co.,

807 S. Franklin Street,

SOUTH BEND, INDIANA.



Cement Building Block the Coming Material.

We are Agents for Machines that Make the Blocks.

We are operating one of the largest block plants in the South, and are in position to demonstrate its success—also manufacturers of crushed stone for concrete purposes.

The Amount of Investment

Necessary to Make Blocks

is Small. . . . Why Not

Be the One in Your Town

to Take Hold of It?

If you will buy the Machine, it will prove a paying investment.

Write us for particulars, also catalogue.

We cheerfully answer all questions.

Newsom Crushed Stone and Quarry Company,

First National Bank Building, :: NASHVILLE, TENNESSEE

THE PERFECTION POWER BLOCK MACHINE For Making Hollow Concrete Blocks.

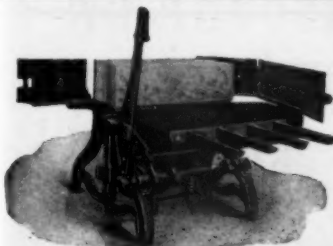
The Only Machine Making Hollow Blocks Under High Pressure.

100 TON PRESSURE
ON EVERY BLOCK.

600 TO 1000 BLOCKS
PER DAY.

OUR MACHINE MADE THE SAND-LIME BLOCK ON EXHIBITION AT THE SAND-LIME BRICK CONVENTION, DETROIT.
WRITE US FOR FULL PARTICULARS.

THE PERFECTION BLOCK MACHINE CO., Kasota Building, Minneapolis, Minn.



NORMANDIN.

High-Grade Concrete Block, Brick, Post, Sill, Cap and Mixing Machinery

"Just remember 9"—"We have the Leaders"—"9 of them"

- 1 Normandin Concrete Block Machine (Face Side).
- 2 Peninsular Concrete Block Machine (Face Down).
- 3 Cemaco Concrete Block Machine (Face Side).
- 4 Champion Concrete Veneer Machine (Face Down).
- 5 Favorite Sand Cement Brick Machine with mechanical tamper.
- 6 Systematic Concrete Mixer.
- 7 Universal Cement Post Machines.
- 8 Practical Sill, Cap, Step, Lintel Mold.
- 9 Superior Ornamental Molds—Baluster, Bases and Balls.

Members of the National Concrete Manufacturers' Association.

CEMENT MACHINERY COMPANY, "Cement Bldg." Jackson, Mich.

Hundreds of Block and Brick plants in operation. The Hollow Block and Brick business is permanent and profitable, broadening in extent every day. It's not a question of material, but is a question of machine.

We are in the business, "first in field, established 1900." We can give you the best value for your money. Write us. Don't delay. Get started. Concrete blocks and brick are in demand. We solicit your trade because we can please you. Our machines are standard; adopted twice by the U. S. Government. Highest awards Universal Exposition, St. Louis, 1904, and Portland Exposition, 1905 for superior excellence.



FAVORITE NO. 1.

Architectural Ornaments

Pleasing Effects Can be Produced by the Use of Our

BALL AND SPINDLE MOLDS

The cost is light but rich, effective beauty is secured to your work. No plant can be called complete without them. We provide for the necessity that has been holding the cement industry back. Write to

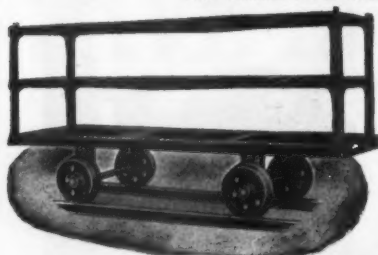
DEVER'S CEMENT WORKS. CASSOPOLIS, MICHIGAN.

Do not wait till others get the equipment, it will pay for itself on one job.



"A GOOD FAIR—Dever's Ball and Spindle Molds."

Roller Bearing Drying and Transfer Cars for CEMENT BLOCKS and BRICK.



Do not buy a car where the corner braces extend below the beams of the deck as they spoil the end blocks.

The only car that has the center of the decks supported without the annoyance of center legs.

Write us for Catalogue No. 5.

The Chase Fdy. & Mfg. Co.
COLUMBUS, OHIO.

The Dunn Hollow Block Machine



COMPLETE in every detail. Especially adapted to the use of the Block manufacturer. Making blocks in all widths, lengths and many designs, including Sills, Lintels, Pier Blocks, etc.

These Machines Combine the Side Face and Face Down Systems. Price \$100

MASONS AND BUILDERS BLOCK MACHINE

MAKES blocks from 2 to 12 inches in width, up to 20 inches long in different designs. No expensive iron pallets required. A practical, rapid and economical machine for the Mason and Builder. No machine at any price makes better blocks or makes them more rapidly or economically. PRICE \$40

WRITE FOR CATALOGS.

Sole Manufacturers in the U. S.
W. E. DUNN & CO., 350 W. Fullerton Ave. Chicago, Ill.

THE FLOUR CITY "Continuous Air Space" Block Machine

HAS NO COMPETITORS,

BECAUSE IT MAKES:

An Absolutely Moisture and Fire-Proof Block.
A Wall with Continuous Vertical and Horizontal Air Chamber.
A Block with Rock Face, Panel Face, Brick Face and Broken Ashler Face
Any Degree Angle Blocks, Arches, Water Tables and Fancy Cornice.
The Only Block Having Two Nailing Points Moulded in Every Stone

Will turn out 150 to 200 Blocks,
in ten hours with two common men.

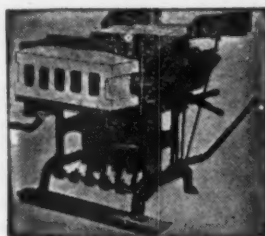
Write us to-day for Catalog, Special Proposition, Exclusive Rights, Territory, etc., etc.
AGENTS WANTED.

THE FLOUR CITY CEMENT BLOCK & MACHINE CO.
701 Sykes Block, MINNEAPOLIS, MINN.

IT IS A QUESTION OF ECONOMY

in buying a Concrete Building Block Machine the same as any thing else. You want the best, at the same time the cheapest. The SIMPLICITY fills both of these requirements.

Write for catalogue and further information.



"THE SIMPLICITY."

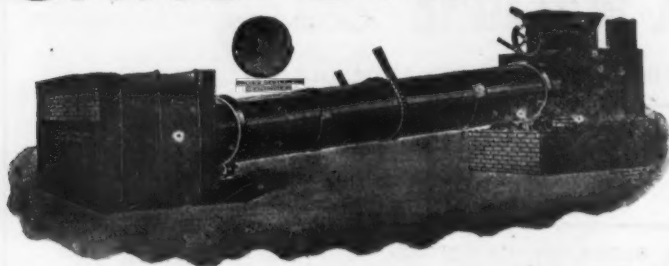
The Standard Sand & Machine Company,

Manufacturers of Labor Saving Machinery

Address Dept. "D."

CLEVELAND, OHIO.

SAND DRYER

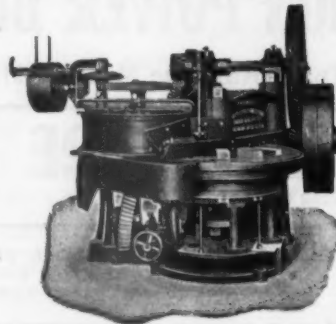


Dryers, Screens, Elevating and Conveying Machinery, Mixers, Concrete Building Block Machinery of all kinds, Power Tampers, Etc.

Ask for catalogue and prices.

The Standard Sand and Machine Company,
CLEVELAND, OHIO.

The American Sandstone Brick Machinery Company, Dept. R. SAGINAW, MICH.



Improved Kennick Rotary Presses are now being built right or left hand, with extra table for making face and fancy brick, on which double pressure is exerted. Our patented rotary brush does the work of one man, and keeps the plunger plates clean.

DON'T confuse our practical system with the so-called Scientific Systems. We have the Practical System, the Practical Machinery, the Practical Press, the Practical Hydration and the Practical Outfit, which is manufactured in our own shops, under the supervision of Practical Men with Practical Experience.

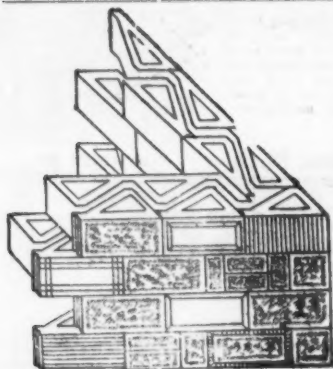
Our Plants are installed under the supervision of practical engineers who know how Sand-Lime Brick should be made, and can be made.

We have practical plants running successfully, to show to prospective investors.

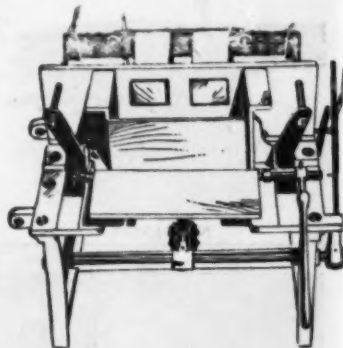
We are Not Scientists.

We produce results, because we are the oldest practical Sand-Lime engineering company doing business in the United States, and we defy contradiction. Incorporated April 1902.

The "Reed" Machines are in the Lead.



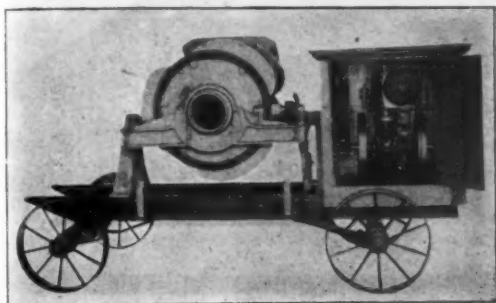
Most simple, rapid, up-to-date Machines on the market. Face-down or Face-side Machines producing single, double, hollow or right-angle tri-angle blocks. Best brick machines out. Our system of two-piece wall excels all others on account of the natural bondage and triple air space. Orders received from all sections of the country are filled promptly. When in the market for concrete block or Brick Machine as well as concrete mixer, get our catalogue and prices. Do you desire to make \$\$\$\$\$\$\$? We can start you right.



The Wichita Coal and Material Co., Wichita, Kan., U. S. A.

Call 'em you saw 'em in ROCK PRODUCTS

The "Clover Leaf" Concrete Mixer

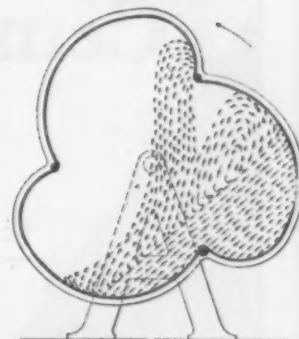


HAS NO INSIDE MECHANISM

The material is doubled over NOT ROLLED.

Note the Points:-

Simple in construction.
Efficient—a mixer that mixes.
Easy to keep clean.
Made in sizes for large and small operators.
We invite inquiries for descriptive catalogue.



Address THE "CLOVER LEAF" COMPANY, South Bend, Ind.



The Standard Continuous Concrete Mixer

"The Mixer that Measures and Mixes."

"You fill the Hoppers, the Mixer does the rest"

CONTINUOUS, AUTOMATIC, FEED EXACT PROPORTIONS.

Materials first Dry Mixed, then "Tempered." Output instantly variable from 0 to Maximum at will of operator, thus insuring Fresh Material for each Block. Feeds Sand and Gravel Dry or Wet.

Write for description and prices to

The Standard Machine Co.,
KENT, OHIO



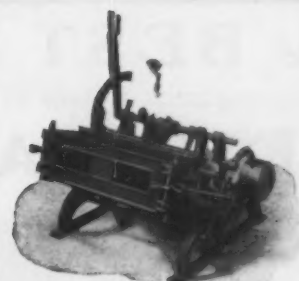
FACE VERTICAL.

—The— RUNYAN

The Latest—The Simplest—The Best

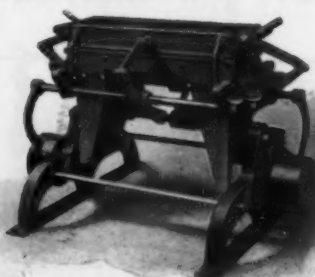
The ONLY successful Mechanical Combination of THREE machines in ONE—Face-Vertical, Face-Down and Brick Machine. All for one price.

Can be converted from a Face-Vertical into a Face-down in ONE minute. It can be changed reversely in the SAME time.



FACE DOWN.

No Advertising Deception But a Genuine Reality



BRICK MACHINE CLOSED.

Can be transformed into a BRICK machine in FIFTEEN minutes.

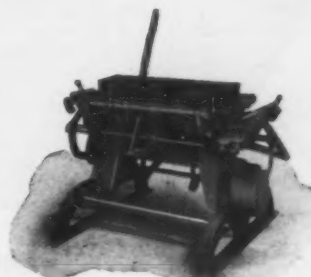
Only one width Straight Pallet necessary on which to make all widths of Blocks, thus saving at least TWO-THIRD of the money spent for Pallets that other machines will require to accomplish the SAME WORK.

We are the original inventors of the Lever-Counterweight Combination with all principles involved; our patents are basic; beware of other machines using our mechanism.

For Further Information Address,

The Runyan Concrete Machinery Co.
75-77 Canal Street, CLEVELAND, OHIO.

GOOD AGENTS WANTED.

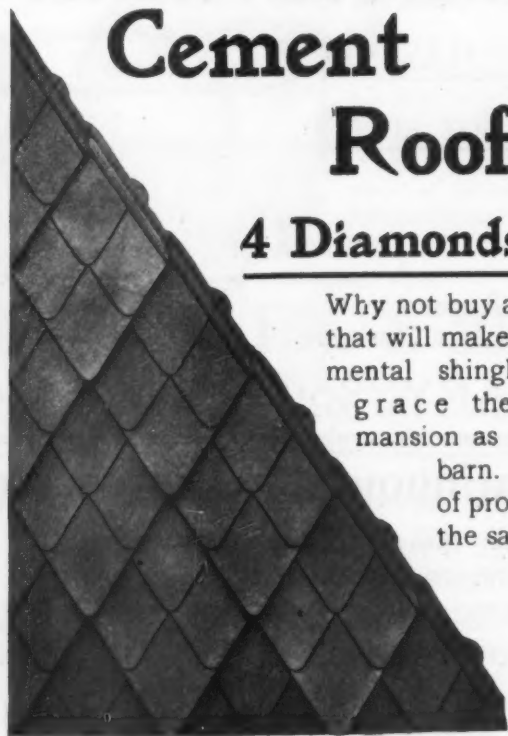


BRICK MACHINE—OPEN.

Tell 'em you saw it in ROCK PRODUCTS.

Cement Roofing

4 Diamonds in 1



Why not buy a machine that will make an ornamental shingle fit to grace the swellest mansion as well as a barn. The cost of production is the same.

The Diamond Cement Machine Co., DESHLER, OHIO.

J. P. STOLTZ & COMPANY,
General Eastern Agents, 420 West 23rd Street, NEW YORK.

The BEST BLOCK IS MADE BY THE BEST MACHINE



ROCK FACE CORNER BLOCK.

THE WARREN CONCRETE BLOCK MACHINE

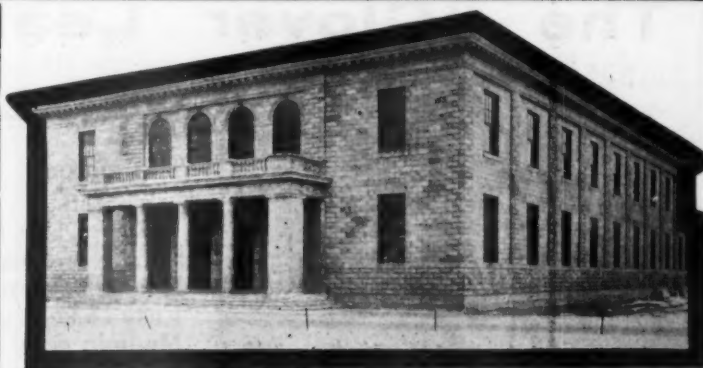
Makes a Hollow Concrete Block that has triple dead air spaces, the only corner block made that cannot be pierced at any angle without striking a dead air space. A wall laid with these blocks is absolutely water and frost proof.

The Warren Machine is easily and quickly operated, adjustable for making any size block desired and arranged for special facing. A durable machine, practical for large or small plants.

Write for full particulars regarding the several different styles of blocks made by the Warren, all possessing the principles of the double and triple continuous dead air spaces.

ADDRESS

Johnson Concrete Machine Co.
215 MASSACHUSETTS BLOCK, :: SIOUX CITY, IOWA.



RESTAURANT BUILDING OF THE GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

This is the Hercules

THIS is the machine that attracted the attention of everybody at the Chicago Convention. This is the machine that hard-headed Contractors admired. This is the machine that made the skeptical Architects sit up and say:

"I guess there's something doing in Concrete after all when such a simple machine can make all those sizes and styles and beautiful designs."

If you are interested on Concrete Construction, you ought to have a copy of the Hercules 1907 model catalog. It contains a fund of Concrete information. It has many pages of halftone illustrations showing Houses, Factories, Churches, Business Blocks and Apartment dwellings built of blocks made on the Hercules.

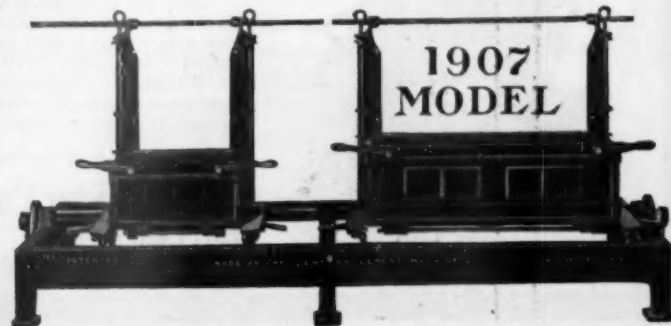
The Hercules is a Face Down Machine.

You tamp on the face. On the one machine you can make blocks of any design from six inches to six feet. You can make two blocks of the same size and design, or of different sizes and designs on the one machine at the same time.

The simplicity of the Hercules appeals to all—no gears—no chains—no levers—no springs—no pins—nothing to get out of order and stop the progress of construction. Changes from one size or design are quickly made. You can fill any order that any Architect specifies if you own a Hercules. You can't if you don't. Send for the new catalog to-day. It's free. Write for catalog L.

Century Cement Machine Co.

179 WEST MAIN STREET ROCHESTER, N. Y.



Tell 'em you saw it in ROCK PRODUCTS.

The Latest Improvement in Building Material.

A Product in Itself, No Imitation.

"ART MARBLE," "LITHOLITE"

—and—

Concrete Building Blocks.

THE THOMAS

Block and System of Insulated Walls

—combining—

Strength, Durability and Beauty.

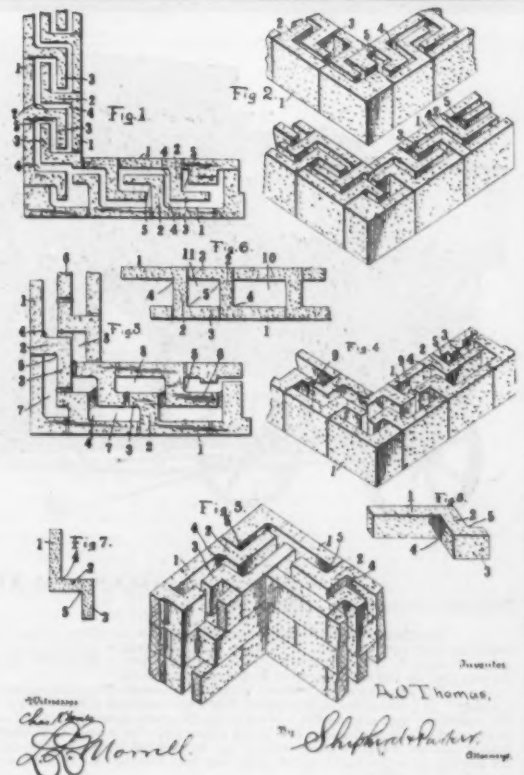
As far superior to common imitation stone as pressed brick is to common, and much cheaper. Our process is based upon scientific principles. Machinery and cost of manufacturing reduced to the minimum.

**BLOCKS NON-ABSORPTIVE
WALLS FROST PROOF**

AGENTS WANTED

**Buy while Introductory Prices
are Offered.**

Patents fully Cover System.



KNUTZEN & ISDELL, General Agents, Kearney, Neb.

THE ANCHOR CONCRETE STONE MACHINES make the only continuous Air Space Block—Make the only Frost and Moisture Proof Block—Make all Blocks on the same Wooden Pallet.

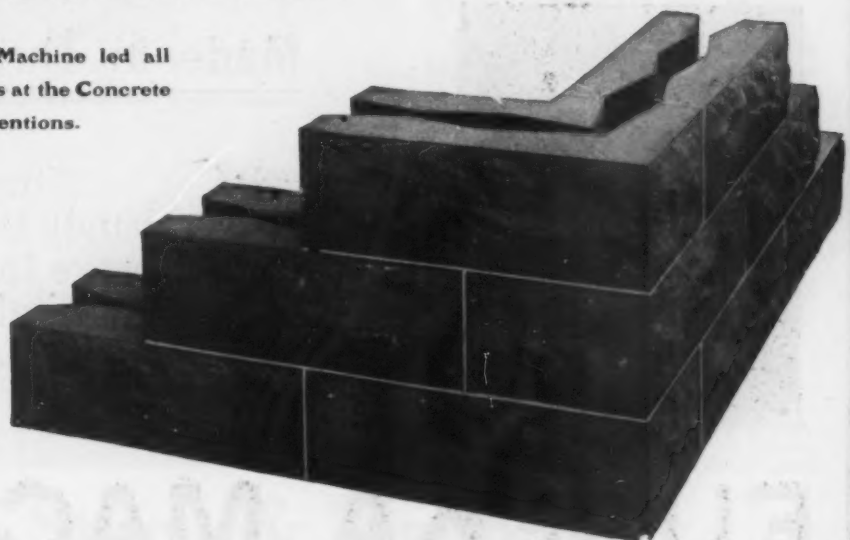
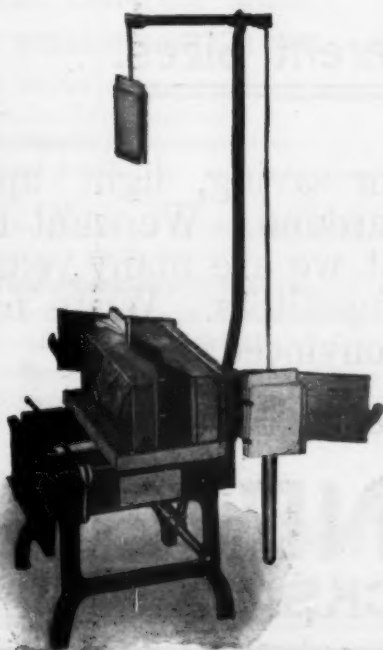
Fully
Protected by
Patents

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GALVANIZED ANCHOR, exact size

**Make Blocks 8 to 16 inches wide without
changing Plates or Pallets**

Our Machine led all
others at the Concrete
Conventions.



Write for Catalogue "B" and Prices

ANCHOR CONCRETE STONE CO.

Rock Rapids, Iowa.



RIGHTLY NAMED
—IS THE—
DEMOREST
**Little
Giant
Mixer**

That was the unanimous expression of unbiased opinion at the Chicago Convention—WHY? Let the following speak for itself and remember that the Batch Mixer referred to is one of the best known:

GRAND RAPIDS REFRIGERATOR COMPANY.

Ballou Manufacturing Co., Belding, Mich.

Grand Rapids, Mich., December 19, 1906.

Gentlemen:—We have been using one of your power mixers for the past month and will say that we are greatly pleased with its operation. We are using at the same time an \$800.00 machine with steam power. The latter is a batch mixer, and we notice every time the men get a little lazy, they don't put in as much gravel as they ought to, which increases the necessary portions of cement. We also notice that in the operation of the batch mixer, four or five laborers are frequently waiting for the batch to be mixed, thus much time is lost; while with your mixer we can load up the wheelbarrows as they come around.

We are also much pleased with the thoroughness with which the cement is mixed with the gravel. It is a perfect mixture and the proportion of cement and gravel can be regulated to a nicety. If purchasers only realized that your machine is more exact in proportion of gravel and cement than batch mixers as they are usually worked, we do not see why you should not sell all the machines that are needed. We also find a great economy in the fuel expense, the coal for the batch mixer costing \$1.40 a day, and the gasoline only fifty cents a day. Another economy is in the cost of the engineer. The batch mixer calls for a man at \$2.50 a day to shovel coal and attend the engine. Your mixer requires no such expense. It also takes fewer men to shovel the gravel into the machine because they can work steadily, while with the batch mixer they have to wait until the batch is mixed and emptied every time. We figure the saving in labor and fuel at \$15 per day over the batch mixer, and they are running side by side, and your machine will make more concrete than the batch mixer.

C. H. L.
H. D.

Very truly yours,

GRAND RAPIDS REFRIGERATOR CO.
(By C. H. Leonard.)

Do You want to save that \$15 a day?

If so, write for booklet to

BALLOU MFG. CO. 35 High Street, Belding, Mich.

MIXERS



Made in Three Different Sizes.

Simple, labor saving, light and handy to move around. We want to prove to you that we are many years ahead of our competitors. Write for catalog and be convinced.

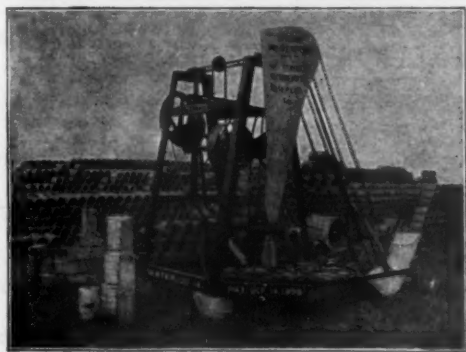
Write for Catalog 3.

EUREKA MACHINE CO.

420 N. Jackson St.

JACKSON, MICH.

Tell 'em you saw it in ROCK PRODUCTS.



What is Your Opinion?

ON THE

Schenk Drain Tile Machine

A Description of our Exhibit at St. Paul, as Given in the January Issue of "Rock Products."

The Cement Tile Machinery Co., of Waterloo, Iowa, had one of the most interesting displays on the floor. There are many money making possibilities in the cement working industry, but none presents a greater field of endeavor for progressive men than the manufacture of cement tile. Cement drain tile have proven superior to any others. They are porous, strong and durable, and absorb the moisture better than any other material. It is claimed that 3,000 tile can be made in a ten-hour-day on one of these machines. The machine works with clock-like precision and held the interest of the visitors. They can make drain tile on this machine in seven sizes, 4, 5, 6, 7, 8, 10 and 12 inches in diameter—12¼ inches in length, making just sixteen to the rod. One of the features of the machine is that one size can be produced just as fast as another. The machine also has molds for making small hollow building blocks. The display was not only one of the most interesting, but one of the most unique in the hall. Mr. Schenk, the inventor of the machine, and W. H. Stewart were on hand in behalf of the Cement Tile Machinery Co.

Grasp the Opportunity and Write

The Cement Tile Machinery Co.

Waterloo, Iowa, U S. A.

Fisher Hydraulic Stone Machinery

Is the only Machinery
Perfected for making
True Concrete Stone.

HYDRAULIC POWER SYSTEM.

A 200 Ton pounding, tamping pressure, uniformly applied.

Condenses the concrete 30%.

Same density from center to surface.

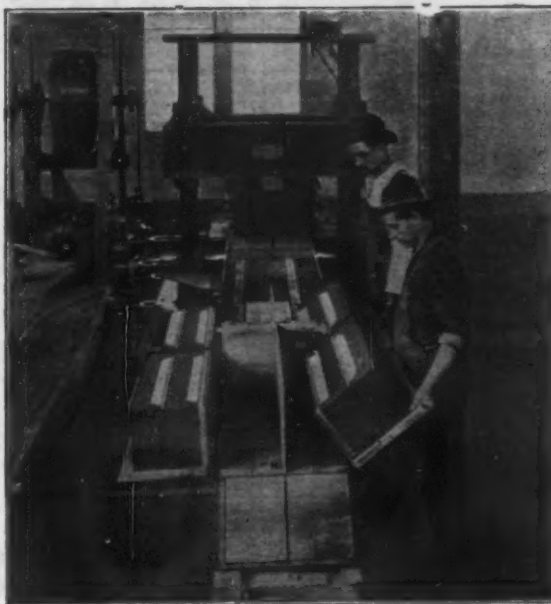
Allows the use of sufficient water to make a plastic mix.

Cement thoroughly crystallized.

These conditions produce true stone of great density and strength.

Stone of all sizes and shapes within dimensions 68x18x9 inches.

ASK FOR CATALOGUE "R"



Turns out from 1500
to 3000 cubic feet of
stone per day.

Solves the problem of producing a high grade, reliable building material at moderate cost.

The demand is constantly increasing
Lumber will soon be exhausted.

Cut stone is generally too expensive.

True Concrete Stone will soon be used as extensively for building as it is now used for paving.

By-products of quarries, mines, furnaces, etc., utilized.

INVESTIGATE NOW.

ASK FOR CATALOGUE "R"

Complete operating exhibit at Convention of National Association of Cement Users, Chicago, January 7 to 12, 1907.

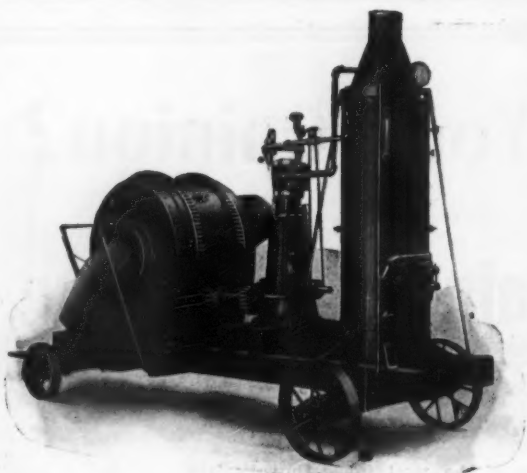
Fisher Hydraulic Stone & Machinery Co.

Builders' Exchange Building,

::

BALTIMORE, MARYLAND

Tell 'em you saw it in ROCK PRODUCTS



STEAM OUTFIT.

The material is thrown back and forth and rolled over and over 100 times per minute.

The **Chicago Concrete Mixer** is lower on the charging side than other Mixers. It is also lighter.

The Mixer does not have to be stopped for either loading or discharging.

Chicago Concrete Mixer

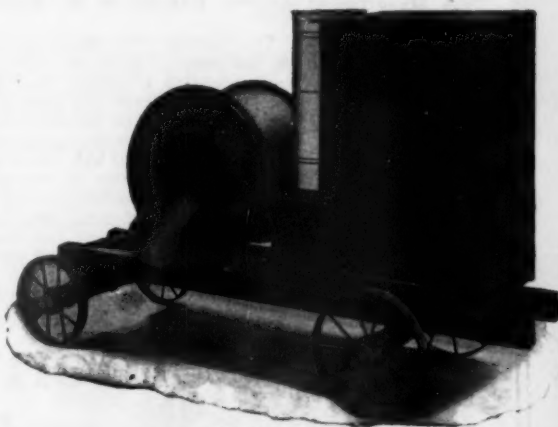
EFFICIENT—SIMPLE—DURABLE

Send for our catalogue which explains why it is the best all round Mixer on the market.

We equip our Mixers with Steam or Gasoline Engine and Motor Power—on Trucks or Skids.

Why dump the Mixed Concrete on the ground and then shovel into wheelbarrows when you can dump direct into barrows with the **Chicago Mixer**?

It is the only Batch Mixer that can dump into wheelbarrows successfully, saving time and expense. Your wheelmen take their load themselves. It does not require an extra man to dump the Mixer.



GASOLINE OUTFIT.

Chicago Concrete Machinery Co.

22-24 W. Randolph St., CHICAGO, ILL.

SHERMAN, BROWN, CLEMENTS COMPANY, Eastern Agents,
78-80 Murray Street, NEW YORK, N. Y.



Peerless Brick Machine, 1907 Model.

Pat'd No. 811518.

The people who use the "Peerless" know its profit making qualities.

We will send you a list of the concerns who have already made money by doing business with us, if you wish.

Make Money

As others have already done it, by making Cement Brick upon a Peerless Brick Machine.

The Price is Right. The Brick are Right.

More Peerless Machines now in use producing a profit to the owners than all others combined.

WRITE FOR ILLUSTRATED CATALOGUE.

Peerless Brick Machine Co.

100 Lumber Exchange,

MINNEAPOLIS, MINN.

Tell 'em you saw it in ROCK PRODUCTS.

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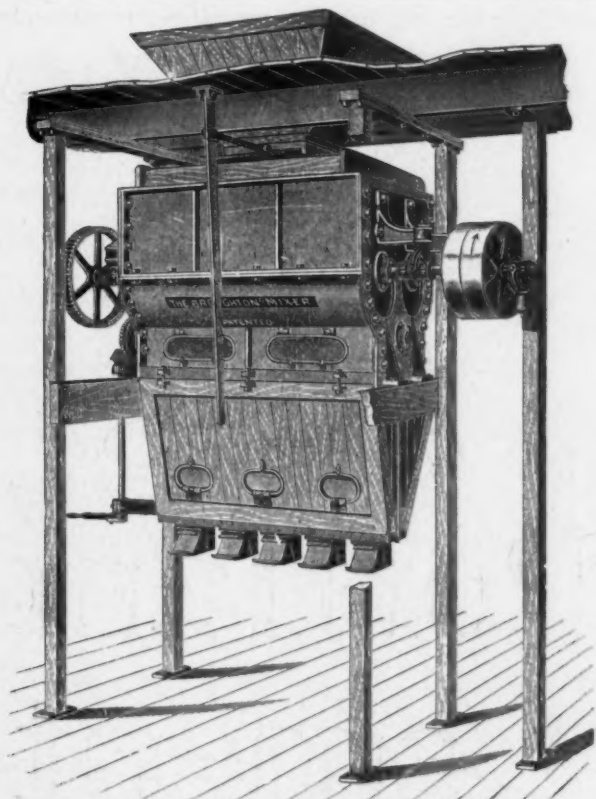
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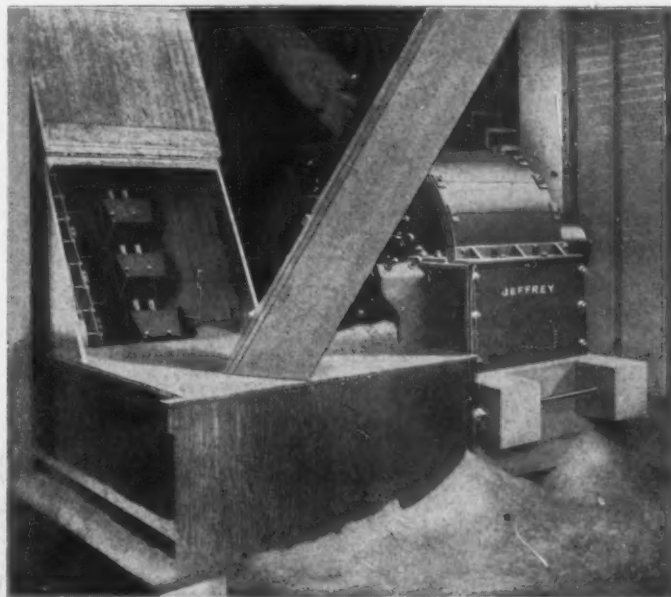


The most thorough and efficient
Mixers of Plaster, Cement and
Dry Materials. Send for Circular.

W. D. DUNNING, Water St., Syracuse, N. Y.

Jeffrey Machinery

Crushing and Elevating Limestone

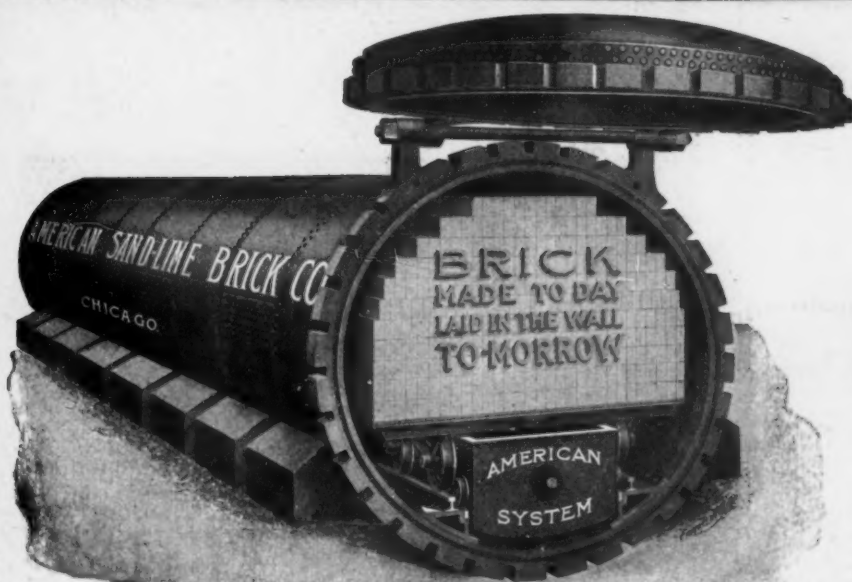


At Plant of Carthage Superior Limestone Co.

Send for free catalogs on
Elevating, Conveying, Screening, Crushing, Power-Transmitting Machinery.

The Jeffrey Mfg. Co., Columbus, Ohio, U. S. A.

New York Chicago Pittsburgh Boston St. Louis Denver Montreal, Canada.



SAND- LIME BRICK

We have had more experience in
equipping, starting and operating SAND-
LIME BRICK PLANTS than any other
concern in this country, and we make
STRONGER GUARANTEES.

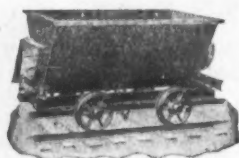
ALL MONEY REFUNDED if brick made in regular work are not equal to samples submitted. No risks
and no expensive experimenting under our method of installing plants. It is the **only safe method** for
beginners in any new industry. Our latest illustrated Booklet gives full particulars. Sent free.

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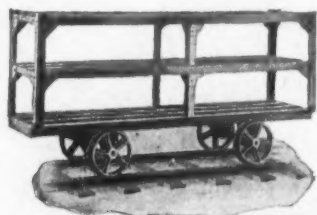
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1306 Great Northern Building, CHICAGO.

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has been used by the foremost engineers, architects, contractors and builders for the past 20 years in the most difficult and important construction ever undertaken in this country, and has been found to be under all conditions

Strong, Sound, Permanent.

"IMPROVED UNION" ROSENDALE

at long periods shows results equal to the average of Portlands.

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ALWAYS UNIFORM

The best cement for both large
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